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Economy of the Arts.

The horse-shoe nails dropped in the streets, carefully collected, reappear in the form of swords and guns. The clippings of tinkers shops mixed with the parings of horses' hoofs, or cast-off woolen garments, appear afterwards, in the forms of dyes of the brightest blue, in the dress of courtly dames. The bones of dead animals yield the chief constituents of lucifer matches—phosphorus. The dregs of port wine, carefully rejected by the port wine drinker in decanting his favorite beverage, are taken by him in the form of Seidlitz powders. The washings of coal gas re-appear carefully preserved in the lady's smelling bottle as an ammoniacal salt.

The First Effect of Hearing Restored.

It is amusing to watch the movements and to note the expressions of astonishment of some of those patients who are suddenly restored to acute hearing. This is most remarkable when the deafness has existed for years. The patients look around for an explanation of the unusual sounds they hear, and then the very movement of looking round rustles the dress, hearing the noise of which they become again bewildered. They cannot be brought to believe that the sounds they hear are natural. The noises in the street are at first terrific.—It is related by the London *Times* that recently a portly gentleman residing in that city on leaving the hospital in which his hearing had been restored, bore it pretty well until he got into Piccadilly, when the noise of the omnibusses—every one of which he thought would be upon him—so frightened him that he started off in a run, and never stopped until he got home.

File Cutting Machine.

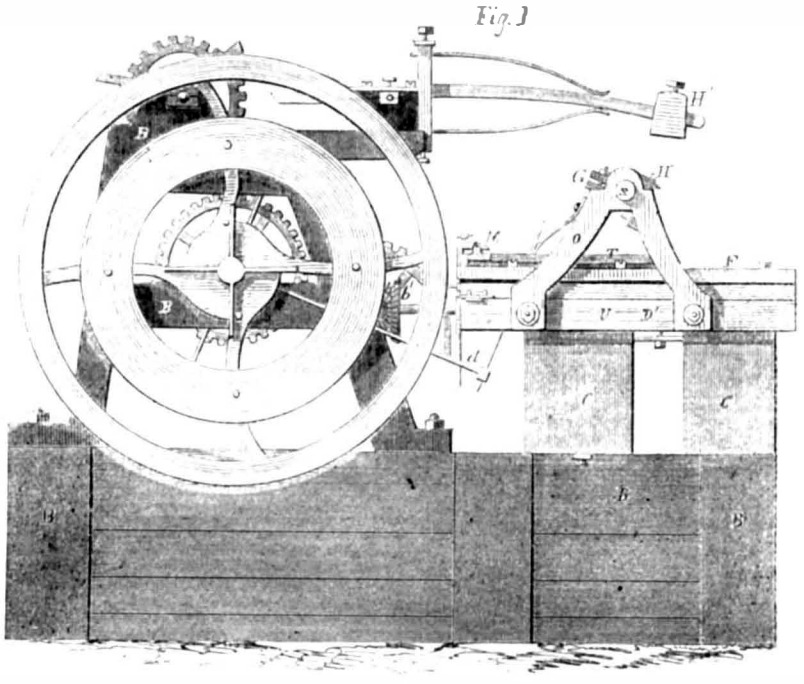
Various machines have been devised and constructed for cutting files to supersede hand labor, but none, we understand, are in successful operation at present. The accompanying illustrations of one, is the first published in our country and in our columns.

Figure 1 is a side elevation, and figure 2 a plan view, of the file cutting machine, invented by M. Lacroix, and recently secured by patent in England, and illustrated in the London *Engineer*.

The machine is designed for cutting two files at once. B B is the frame of the machine, and C C are two supporting pieces of the table, U. There are two carriages on the table, which are movable on a center, D. The two guiding pieces, F F, are secured on the carriage, between which slides the file rests, T; a pair of jaws, M, hold each file. O is the bracket (one on each side) for supporting the shaft, Z, on which the spring chisel holders, G G, are fixed by screws; H H are cutter chisels secured by screws; H′ H′ are hammers, secured by a screw on the lever or handles, R, each movable on an axis, to set it to any angle. D D are two cam wheels on shaft K; and K′ is a cog wheel on the same shaft, actuated by the wheel, P′, on shaft P, which carries the fly wheel. A pulley on the fly wheel is actuated by a band from any main driver—steam engine or water wheel; *d* is a clutch lever for the workman to throw the machine in and out of gear—stop and set it in motion. An accurately divided tooth

MACHINE FOR CUTTING FILES.

Fig. 1

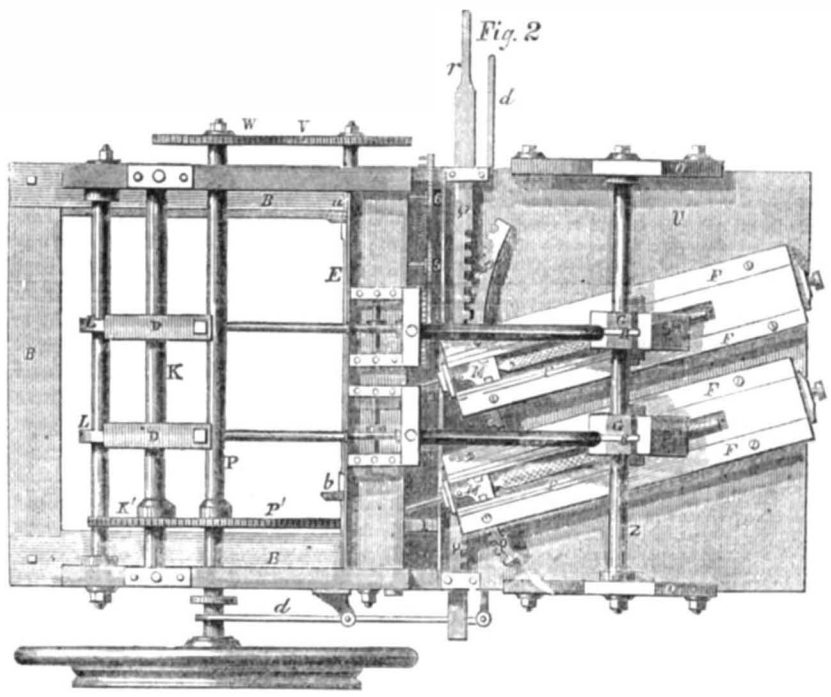


wheel, W, is secured on the opposite end of shaft P, and can be replaced with another to modify the fineness of the cut of the file. It gears with the wheel, V, on the shaft, E, and two bevel wheels, *a b*, gear with similar ones fixed on two peg wheels, 1 and 6, which gear on either side with intermediate wheels, 2, 3 4, and 5. A spring above and one below each hammer handle regulate the force of the blows.

In figure 2 the file carriages on table U are placed towards the left, and the files are placed on the rests, T. Two toothed segments, Q′, of a circle are made fast on each carriage, and gear with a rack, Q, on lever, *r*, to change the position of the files, right or left, for the first or second cutting.

A division screw of about 1-16th of an inch, engages in a nut on each file rest, which slides in grooves in the guides, F; one of the ends of the division screw has a collar, which turns freely in a bearing on one side of the carriage; the other end of the division screw is received by a center pointed screw at the other side of the same carriage; toothed wheels gear with the peg wheels, 4 and 6; the latter, turning towards the right, cause the said wheels, as well as the division screws, to turn to the left, and thus the file rest is carried back to the other side of the carriage. When the first cutting of the file is effected, the catch is removed from its rack, which being moved forward, the carriages are moved to the left on the table, and the toothed wheels then gear with peg wheels, 1, 3, which, turning to the

Fig. 2



left, cause the said wheels and screws to turn to the right, bringing back the sliding rests, T, to their starting point. The file is then cut with double cross cuts. The inclination of the cuttings of the file is given by the inclination of the carriages, F F. The wheel, W, on the shaft outside the frame gears with the wheel, V, fixed on the same shaft as the bevel wheels *a b*. If the wheels, W and V, are of equal diameter, and the wheel K′ half the diameter of the wheel P′, the cam wheel should revolve twice when the wheels W and V, the bevel wheels, *a b*, and the peg wheels, 1, 2, 3, 4, 5, 6, revolve once; thus the hammer will strike three blows for each half turn of the screw, or three cuts in each eighth inch. If the wheels, W and V, be not of the same diameter, the first being greater or less, the cut of the file would be coarser or finer, by changing these wheels the cut required will be obtained. In order that the chis or cutter may bear truly on the file, the file rest is movable, and made half cylindrical, with a collar at each end working in suitable bearings. This half cylinder bears in its length in a groove cut in the brass rest, and the bearing on which the file is held fast by the jaw, M, is secured by screws on the face of the half cylinder, which allows the file to recline in all directions, and the chisel to bear on the whole breadth of the file. D′ is a round iron plate fastened on the carriage, and turning in the table, U, to allow the carriage to turn to the right or left, as required. Cams, L, are fixed on the cam wheels, D D.

This machine has not been patented in the United States, it is therefore public property at present. It appears to embrace every motion requisite for cutting files, such as the fineness of cut, the force of the blow of the hammer, the inclination of the chisels and all the devices necessary for cutting either straight or cross-cut files.

Galvanic Decomposition of Water.

The following, from the Philadelphia *Ledger*, describing a contrivance for exhibiting the action of galvanism in decomposing water, will be of interest to every man of science. The action is described by Lardner to be difficult of explanation:—

"One of the latest, and, in itself, simplest and most useful, for the purpose of illustration, is a contrivance to explain the nature of galvanic decomposition, made by Professor Rogers, of the University, and suspended in the Lecture Hall, before the class. It consists of a board, representing a vessel containing sulphuric acid. At one extremity is let down a plate of zinc—the positive; and at the other extremity the negative pole—a plate of copper. The manner in which the atom of oxygen combines with that of hydrogen, in its passage across the liquid, from one electrode to the other, is shown by the pulling of a string, which brings the two in contact, and so on till the whole is traversed, when, having no atom to unite with, it (the atom of hydrogen) escapes free, and returns towards the positive pole, again to form a fresh union.—This simple contrivance promises to be of great use to the student, and, when brought before the class, elicited much admiring approbation. Professor R. explains the process of silver plating, and exhibits a beautiful pitcher made by Mead. It was remarked that the britannia ware might be made as thin as desired, and the silver deposited with any depth wished, and that thus a far more beautiful article could be made than with the hand."

New Preparation of Cotton.

The Charleston (S. C.) *Mercury*, in noticing the articles on exhibition at the late fair of the Mechanic's Institute in that city, describes a new preparation of cotton, which appears to be a valuable invention. It says:—

"Mr. J. M. Legare, of Aiken, sends a stand, rustic table, reading chair, Emperor Adrian's cabinet, picture frame, library screen, &c., made of cotton, which imitates carved woodwork, by subjecting it to a chemical process. In its use it is pliant and ductile, and may be molded if desired, but with still greater facility worked up by hand without molds. When dry it is moderately elastic, is not affected by heat, cold, or moisture, and possesses a hardness and tenacity beyond the hardest wood."

The Fair is stated to have been an excellent one in every respect, and was very well conducted.

The *milk sickness* is at present prevailing in some districts in Illinois, and great numbers of the cattle have died. It is caused by a long drouth. The people have learned to refrain from drinking milk, and eating meat and butter where it prevails, and thus they escape being infected with it.

A new seam of cannel coal has been discovered in Clinton Co., Pa.

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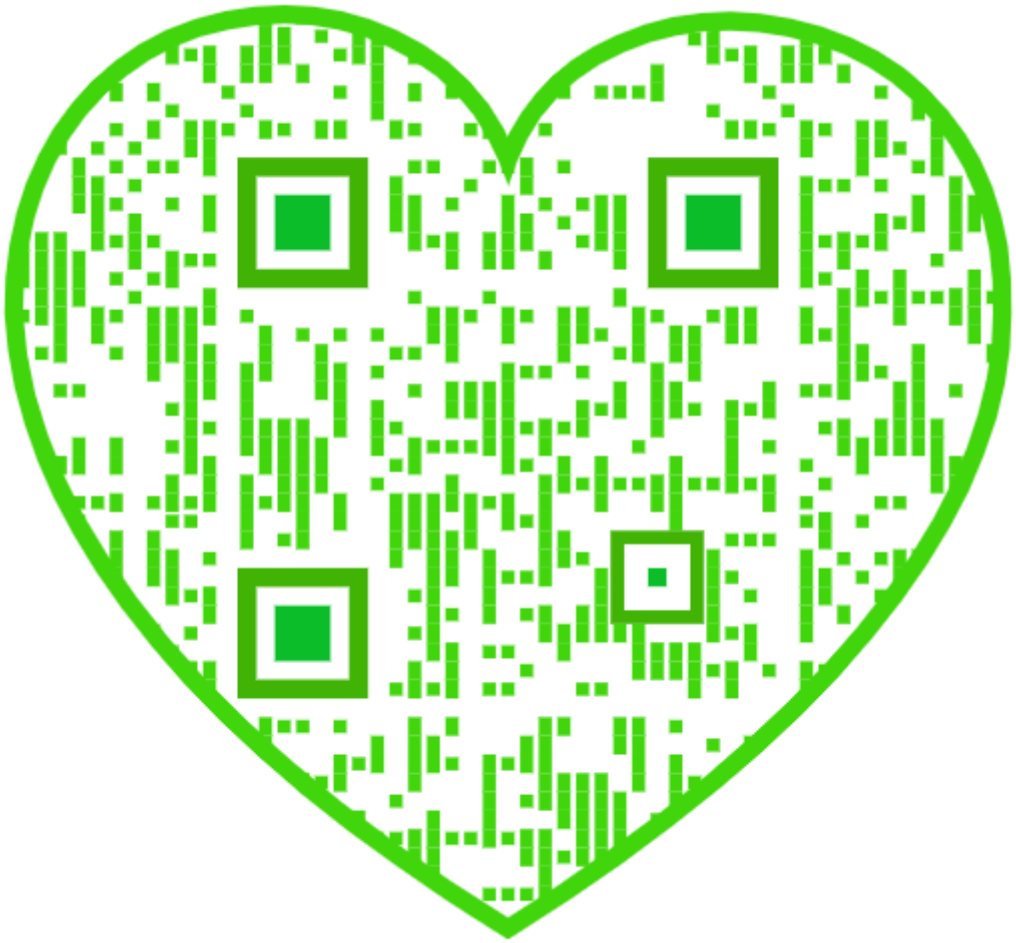

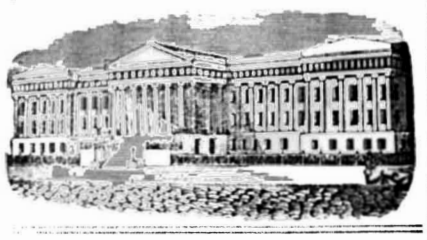

Advice to American Patentees Concerning Foreign Patents.

It is generally much better to apply for foreign patents simultaneously with the application here. If this cannot be conveniently done, as little time as possible should be lost after the patent is issued, as the laws in some foreign countries allow patents to any one who first makes the application, and in this way many inventors are deprived of their right to take patents for their own inventions.

Many valuable inventions are yearly introduced into Europe from the United States,—by parties ever on the alert to pick up whatever they can lay their hands upon which may seem useful.

It is a part of our business to secure European patents —in fact three-fourths, and probably more, of all the patents granted in Europe to American citizens, are solicited through this office. We have faithful agents in the chief cities in Great Britain and on the Continent, and through them we can not only solicit patents, but often effect their sale upon advantageous terms. We can give the names of many of our patrons who have realized fortunes out of their European patents through our Agents abroad, if it is desired

We are prepared at all times to furnish advice in regard to Foreign Patents, and will cheerfully do so on application personally at our office or by letter.

Models are not required in any European country, but the utmost care and experience is necessary in the preparation of the case.

Almost every invention that is of value in this country is of equal value abroad, and we would recommend patentees to pay more attention to securing their inventions in foreign countries than they have heretofore done.

All particulars in regard to the modus operandi of obtaining patents in any country where patent laws exist, may be had by addressing the publishers of this paper.

MUNN & CO.,
128 Fulton street, New York.

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

issued from the United States Patent Office

FOR THE WEEK ENDING NOVEMBER 25, 1856.

STUFFING HORSE COLLARS—Joseph Albright, of Greenville, Tenn.: I do not claim separately the toothed revolving feed, arranged for operation in connection, from the outside, with a rack-built hopper, as such is described in the patent granted to Gerad Sickles, Nov. 20, 1855.

Nor yet do I claim, separately of themselves, the crooked fed straw retaining spaces, c3, described, as the equivalent of such is found in the bearded rack described in the patent of H. G. Robertson, June 20, 1856.

But I claim in horse-collar stuffing machines the intermittently revolving toothed feed wheels, a, when arranged at the back and on the outside of the hopper, in combination with the crooked fed straw retaining spaces or chamber, c3, at the bottom of the hopper, and extending backwards, as shown and described, the teeth of the wheels, a, which work from the outside at the rear into the hopper, urging the slip of the straw down the inclined rack or back of the hopper, and feeding it in to the retaining spaces, c3, to wait the action of the plunger, as set forth, and whereby the many advantages specified are obtained.

LATHE FOR CUTTING FLUTED MOLDINGS—James Anderson, John McLaren and John Bryant, of New York City: We claim, first, the adjustable rotating cutters, q q, attached to shafts, p p, which are fitted in frames o o, the frames being fitted and working in pendant guides, n n, attached to the adjustable block, G, substantially as described for the purpose specified.

Second, we claim placing the leg, E, between centers which are attached to a swinging frame, C, fitted on a reciprocating carriage, B, the leg being turned or rotated between its centers as the carriage moves, by means of the inclined slot, i, in the ledge or plate, j, and the lever, h, and gearing, f g, as described.

[This is a good improvement on machinery for cutting spiral fluting on the legs of articles of furniture. There are two sets of adjustable rotary cutters rotating in opposite directions, and an adjustable reciprocating feed carriage which holds the article, which is turned by a guide block, lever, and gearing, so that it is fluted in an expeditious manner. This invention is ingenious. The machine flutes cylindrical, or tapering legs.]

PRINTING PRESSES—F. L. Bailey, of Boston, Mass.: I claim the combination of the stationary bed, D, with the revolving distributing cylinder, G, when the two are placed within the circle of revolution of the ink rolls, H, as set forth.

Second, I claim the impression lever, M, in combination with the connecting bar, L, when the two are so arranged that they may be disconnected at pleasure for the purpose set forth.

FOURNEYRON TURBINE WHEEL—Stephen K. Baldwin, of Gilford, N. H.: I do not claim the water guides, J J, &c., or the circular gate, N, or any particular method of applying the water to my wheel, as there are various methods in which it may be done.

But I claim the extending of the bucket, B, of the Fourneyron turbine water wheel further inward towards the center of the wheel, either on the radial lines or on lines varying either side of the central point, and thence upward and outward so as to receive the direct action of the propelling water against the extended bucket on the outside of the wheel, and above the Fourneyron turbine part, as described.

TREATING FELDSPAR—Charles Bickell, of Baltimore, Md.: I claim the decomposing of feldspar by heating it with lime and phosphate of lime, for the purpose of obtaining potash or soda either in the caustic or carbonated state, or for the purpose of obtaining a manure, in the manner substantially as described.

ALCOHOL COOKING APPARATUS—Thomas G. Clinton, of Washington, D. C.: I do not confine myself to the arrangement of the parts, E D C G, as shown, because these parts may be arranged otherwise to do the very same duties.

I claim an alcohol burner arranged in its several parts substantially as described and represented, or in any equivalent manner, for the purposes and effects set forth, irrespective of the method by which alcohol is supplied to the chambers, A and I.

I also claim the internal pipe, B, or its equivalent, arranged as described in relation to the tube, H, and for the purpose and effect set forth.

BOXES AND AXLES, JOURNALS, &C.—David Cumming, of Sorrel Horse, Pa.: I claim the V-collar or bearing, a b, running in a V-groove, as described, and the construction of the box in two separate parts, with the oil receptacles, as described.

BACKGAMMON AND CHECKER BOARDS.—Edwin O. Goodwin, of Bristol, Conn.: I claim the construction of draught boards with the indentations on the face, the raised divisions in the backgammon part, and the drawers for the pieces, all in combination, in the manner and for the purpose substantially as set forth.

POLISHING LEATHER AND HARNESS—William Crane, of Brooklyn, N. Y.: I claim the suspended triangular swinging frame, C, having a socket or receiver, D, attached at one end, and a pitman or connecting rod, F, at the opposite end, substantially as shown, the whole forming an equal balance, giving a steady motion to the machine in operation.

[A great amount, if not most of the morocco manufactured in our country is still finished by hand labor, which is tedious and laborious. The tool used is a small creased ball of hard wood, held in the workman's hand, and rolled over the skin, which is placed on an inclined bench. This improvement is designed to supersede the hand ball; it is a machine, which, by rotating a pulley, moves the creasing tool over the skin, and gives it the finishing trade mark. The improvement appears to be a good one, and is designed to effect an important object.]

CURRY COMBS—Evan L. Evans, of Providence, R. I.: I do not claim simply constructing curry combs with flexible backs, for this has been previously done.

But I claim constructing the curry comb with an elastic or flexible back, A, formed of india rubber, and securing the teeth, a, permanently in the back, by having the india rubber which encompasses the teeth project from the face of the back in the form of ridges, b, and cones, c, projecting to the point of the teeth, substantially as shown and described.

[By this improvement in curry combs the teeth are firmly secured in the comb by the india rubber back, and they are not so liable to work loose, like those of the common combs. Combs thus made are, therefore, more durable.]

MANUFACTURING COTTON YARNS—George G. Henry, of Mobile, Ala.: I do not wish to be understood as limiting myself to any precise sequence of machinery after the combined gin and lap machines, for it is obvious that my invention may be applied to any preferred machinery for manufacturing cotton yarns.

I am aware that it has been proposed to spin cotton yarns directly from the gin, as in Brant's patent of 1823, and by other modes. This I do not claim.

But I claim the combination of the gin and preparation, substantially in the manner and for the purposes described, that is to say, the arrangement of the cotton gin in immediate connection with, and to operate in combination with the spreader or lap machine of any desired construction, so that the gin and spreader combined shall operate in a regular sequence with the carding and drawing, and other spinning machinery, substantially as set forth.

LATHES FOR PLANING METAL—William W. Hubbard, of Boston, Mass.: I claim arranging the tool carriage slides or supports on the vertical sides of the frame or bed, in combination with arranging above such slides, and so as to project from the sides of the frame, and over the slides, substantially as explained, coverers or guards, whereby the slides are protected from dust, chips, or other matters, as specified.

STITCHES FOR SEWING MACHINES—A. F. Johnson, of Boston, Mass.: I claim making a stitch of a single thread by throwing a shuttle and thread through a loop formed from the shuttle thread, as described, thereby tying or knotting each stitch, for the purpose of uniting pieces of cloth or other material to be sewed.

MAKING SPOKES BY HAND—Edward Julier, of Sharon, O.: I claim the construction and arrangement of the pattern cam gauge device, s2 g2, the jointed lever device, m2 m2 k2, the collar shank, f2 h2, and spring pawl, l2, when operated by the pedal, P2, or its equivalent, together and with the stop or dog, f2 g2, and ratchet, K, in the manner substantially as described, or in any equivalent manner.

I also claim the graduating straddle gauge, w w w w2, and hinged or jointed, forming gauge rest, z z2, with the graduating set plate and yoke devices, a2 b2, &c., with the knife shields or buffer heads, g g u u, substantially as described and shown.

TURNING CIRCLES FOR CARRIAGES—George Kenny, of Milford, N. H.: I claim an annular box plate composed of two circles, one attached to the head block or rocker, and the other to the axle, and so constructed as to form a box for excluding dirt and grit from the bearing surfaces of the circular plates, in which box is inserted a washer of oiled leather, the box joint serving to exclude all dirt and grit from the bearing surfaces, and thereby preventing their rapid wear, and the leather washer preventing the squeaking noise and friction common to all other modes of connecting turning circles, and preventing the jar which would otherwise be occasioned by two metallic surfaces striking together, as set forth.

I also claim combining with a circle a rubber or other elastic friction roll, upon which the said circle turns, to lessen the friction and noise, and diminish the wear, as set forth.

TURNING BOOT LEGS—M. C. Chamberlin and W. Filkins, of Sheldon, N. Y.: We claim the expansion tube, g the rim follower, h, encircling said tube, the disk plunger, J, provided with hooks, i i, and operated inside of said tube, g, as described, in combination with racks, E and f, and pinion, o, for the purpose of imparting adverse longitudinal motion to said rim follower and disk plunger, as set forth.

TUBULAR CONDENSERS AND HEATERS—Uel West & Abner Mills, of New York City: We claim the connection of the ends of the tubes, B B with the conductors, C C, by squaring the ends of the tubes fitting the squared ends of the tubes of each row close together, and making tight joints between them, and inserting the whole united row directly between the two parallel sides or portions, g g, of the conductor, and securing each tube closely to the said sides or portions, g g, substantially as described.

[It has always been very difficult to construct steam condensers, because they are subject to a vibrating action of expansion and contraction, which, in the course of time, loosens their joints, and destroys their usefulness completely. This improvement is designed to dispense with tube sheets in tubular condensers, and at the same time preserve the joints around the tubes perfectly tight.]

FIRE ARMS—Alex. Le Mat, of New Orleans, La.: I claim the combination and arrangement of the hammer and finger with the mechanism as described, whereby the retrograde movement of the hammer, after the ignition of the primer, produces an automatic closing of the vent by the finger.

TRAVELING TRUNKS—S. W Phelps, of Cincinnati, O.: I claim the arrangement, substantially as described of drawers, partitions, and side lids or doors for the combined purposes of security, orderly arrangement and accessibility of all the contents in a traveling trunk, as set forth.

EXHAUSTING AIR FROM AND HERMETICALLY SEALING CANS AND VESSELS—A. M. Purnell, of Washington, D. C.: I claim the apparatus constructed and operated as and for the purposes described.

DISK FOR SHELLING CORN—J. P. Smith, of Hummelstown, Pa.: I claim the annular concave shelling surface, N, on the face of the shelling disk, when employed in combination with the other parts of the machine, substantially in the manner and for the purpose described.

EDGE-KEYS FOR MAKING AND POLISHING THE EDGES OF BOOT AND SHOE SOLES—G. C. Todd, of Lynn, Mass.: I claim a turned or circular edge key, constructed substantially as described and for the objects specified.

GAS COCK AND SWINGING JOINT—C. F. Thieme, of Philadelphia, Pa.: I claim making a swinging joint for gas brackets, substantially as described, the same consisting of the tubular plug, B, and its cap, B,' with the leather washer, k, and spring, i, or their equivalents, in combination with the barrel, A, constructed as set forth and described, so as to produce a gas tight swing joint without the usual boring and grinding required as described.

I also claim the combination of the key with the lower end of the plug, when the same is used as a gas cock, so as to dispense with a distinct barrel heretofore required for a cock, the said key being constructed, combined, and operating substantially in the manner set forth and described.

HOISTING COAL—J. C. White and Robt. Hay, of Tuckerville, Pa.; We claim the bucket, K, with its inclined base, its doors, b and d, and spring latches, h and h', in combination with the chute, L, and inclined planes, i i', the whole being arranged substantially in the manner set forth, and for the purpose specified.

ADJUSTABLE CUT-OFFS FOR STEAM ENGINES—William Wright, of Hartford, Conn.: I claim the construction and arrangement of the adjustable cut-off, consisting of the cylindrical hubs, disks, and their adjustments, substantially as described.

I also claim the flap valve checks constructed and combined with the drop valve, as described.

FINGER BAR ARRANGEMENT FOR HARVESTERS—J. A. Moore and A. A. Patch, of Louisville, Ky.: We claim on folded sheet metal finger bars the combination and arrangement, substantially as shown and described, of the folded sheet metal bar, A, with fingers, B, when the latter are inserted through holes in the front and rounded folded portion of the bar, and griped and pinched between and by the lips of the bar in the rear, and secured essentially as specified.

HAND CORN PLANTER—T. A. Chandler, of Rockford, Ill., assignor to Harlow Herrick, of La Grange, Ohio, and T. A. Chandler: I claim the slides C E, diggers, R R', and rod, I, substantially as set forth, and operating in the manner and for the purpose described.

Second, I claim the jaws, K K, cut-off, S, and arm, L, when constructed and arranged as described, and operating substantially in the manner and for the purpose set forth.

RAKING ATTACHMENT FOR HARVESTERS—William Whiteley, Jr., of Springfield, Ohio, I claim the combination of the balance lever, K, with plate J, for operating the rake, H c, in its forward motion, in the manner and for the purpose set forth.

[This is a very simple self-raking attachment for harvesters. The teeth of the rake extends across the platform, and receive a reciprocating motion through a connecting rod and crank, operated by connecting devices from the main axle. The pitman or connecting rod of the rake can also be adjusted so as to rake off gavels or bundles of different sizes. All the parts of this raking apparatus are simple, and not liable to get out of order.]

SEWING MACHINES—Wm. C. Watson, assignor to himself, Geo. H. Wooster, and Morris Knight, of New York City: I claim the revolving and reciprocating looping-hook, constructed and operating substantially as described.

I also claim the inclined and grooved brace plate, i, so placed beneath the cloth, as to deflect the lower end of the needle to one side of its path, whereby its vibrations are prevented, and it is secured from breakage by the lateral pulls, as set forth.

[This patent is for a neat, small sewing machine for family use, which can be constructed and sold for about ten dollars. It will be illustrated in our next number.]

RE-ISSUE.

NUT MACHINES—Robert Griffiths, of Philadelphia, Pa. Patented Oct. 30, 1855: I claim a combination substantially as described, of tables, boxes, and punchers, the same being arranged and operated in the manner set forth, or any equivalent thereto, for the purpose specified.

ADDITIONAL IMPROVEMENTS.

ROTARY BRICK MACHINE—Geo. Crangle, of Philadelphia, Pa. Patented June 3, 1856. First additional improvement Sept. 9, 1856; second, Nov. 25th, 1856: I claim the application of the cut-off slides, E E', so as to slide up and down in contact with the plunger, B B, respectively, as described, and so as to produce, in combination with the lower guide piece C, the alternately open and close chambers, beneath the plungers, substantially in the manner and for the purpose set forth.

HARVESTING MACHINES—Geo. Esterly, of Heart Prairie, Wis. Patented Oct. 22, 1854 I claim the method of constructing the arm of the axle, A, in combination with the metallic box, Z Z, and the socket and yoke, b', as shown, whereby the adjusting apparatus is placed beneath the body of the carriage, the whole being substantially combined and arranged as set forth.

DESIGN.

KITCHEN STOVES—S. W. Gibbs, of Albany, N. Y., assignor to T. H. Wood, H. S. Hubbell, and J. E. Roberts, of Utica, N. Y.

Negative Wells.

The Society of Arts have published Herr Bruckmann's paper on "Negative Artesian Wells,"—that is, wells which take in instead of giving out water. Such wells serve as permanent drains; they are sunk in loose strata, or where communications exist with fathomless fissures or with deep lying streams. Mr. Bruckmann, who is a native of Wurtemberg, states that they may be established "in all the so-called normal or sediment formations; diluvium; tertiary deposits; chalk, Jurrassic rocks," and others. And he brings forward examples of the benefits that have followed the sinking of negative wells in towns or in swampy country districts. The drainage becomes at once perfect and constant; fluid matters of all kinds find their way to the mouth, and flow away, while solid matters may be stopped, and used in fertilization. We should like to see this project brought to the test of fair experiment. What an enormous expense would be saved in the drainage of London, if the sinking of a few negative wells would really suffice for the discharge of all its fluid waste!

[The above is from *Chambers' Edinburgh Journal;* our readers will perceive that these *negative wells* are nothing more than the *cesspools* so common in many parts of our country, for draining off surplus surface water from cellars in sandy soil, where there are no drains. But no person here would ever suppose they could be employed as substitutes for drains in cities—they cannot be.

Fox & Henderson, the engineers and great contractors, whose names will no doubt go down to posterity, as the builders (not designers) of the London Crystal Palace, have failed. It is stated that they will be able to pay all their debts, if they are allowed time to do so, and their creditors have manifested sympathy for them.

There are annually manufactured in the United States 2,160,000 shovels, or about six hundred dozen per day.

A Copyright Trial.

A peculiar trial for alleged infringement of a copyright, recently took place in the U. S. Circuit Court of Boston, and as this case has some relationship to a patent trial, we present the following summary of it from the *Boston Telegraph*. The parties were E. C. Rogers, against J. P. Jewett and others:—

"The sixth section of the Act of the United States, respecting copyright passed in 1831, provides that after the copyright of any book has been secured, any person who publishes "any copy of such work," without the written consent of the proprietor of the copyright, shall forfeit every copy of such book so published to the proprietor of the copyright, and shall also pay fifty cents for every sheet found in his possession, half to the owner of the copyright, the other half to the United States. Rogers published a book called the "Philosophy of Mysterious Agents," of which he secured the copyright. The defendants published a book written by Rev. Dr. Mahan called "Modern Mysteries Explained and Exposed." Rogers brought a *qui tam* action on this statute to recover the fifty cent penalties alleging that a part of his book was copied into Mahan's. The defendants demurred to the declaration. The court (Judge Curtis) held that the penalty given by this section could only be incurred by publishing the whole book, that it could not be incurred by an infringement of the copyright by publishing extracts, the only remedy for which would be a civil action. The demurrer was accordingly sustained, and the Court held that the defendants were entitled to judgment in their favor."

Pats on the Shoulder.

We are under many obligations to the Editor of the *Gazette*, Dover, N. H., and the *Eagle*, Grand Rapids, Mich., and the *Vinton Eagle*, Iowa, and especially to J. C., Rogers, of Wyoming, Mich., for courtesies and highly complimentary notices of the SCIENTIFIC AMERICAN. Gentlemen, we hope you will all grow rich and enjoy a long life of substantial happiness.

A Diamond Mistake.

The New York *Mining Magazine* states, that during a lecture on Mineralogy, at the Truro Institution, Eng., Capt. Mahmoud, as an instance of the practical importance of being able to ascertain the scale of hardness of minerals, related a circumstance that occurred to a gold-digger. When working at the diggings he found a rock crystal, and thinking it was a large diamond, he immediately left his work and went home. He invited a friend to take tea with him, and produced the supposed diamond on the tea-table. His friend offered £200 for it, which the digger refused to take. He made his voyage to England, and on arriving in London went to a mineral dealer, and offered him the precious stone for sale. The dealer, however, on trying its hardness, found that it was only common quartz, and after convincing the digger of his mistake, he gave him a few shillings for it on account of its beauty.

Making Rifles of Old Muskets.

At the U. S. Armory, Harper's Ferry, A. M. Ball, foreman, of the millrights, has invented and introduced a machine for rifle-grooving old muskets, so as to render them, when fitted with the proper lock, identical with the Minie gun. Each machine turns out daily from fifteen to twenty Minied muskets. He has also invented a breech-tapping machine for cutting the thread into which the barrel is screwed—an operation formerly done by hand. In economy of time and labor, and of course money, Government derives from these two inventions great advantage.

How Beans Climb.

A correspondent, "M. S.," of Brooklyn, inquires of us if we can tell "why lima bean vines always turn round their poles in one direction?" If our correspondent means their *spiral* direction round the pole, we answer, "how is it possible for them to turn in any other direction?" If he means a direction from East to West, or West to East, we answer, they cannot have any such a direction, when their path up the pole is a spiral.

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Which is the best Saw Mill?—The Mulley.

MESSRS. EDITORS—The manufacture of lumber attracts a large share of public attention, and there has been quite a number of patent sawing machines lately introduced. We have also had several communications in your valuable journal about the different kinds of mills best adapted to the manufacture of lumber, also the amount cut by the various kinds. Some of the stories about "the thousands of feet sawed in 12 hours" were based, I suppose, on lumber, measured "in lump" through a magnifying glass; at least, I have taken the liberty of placing rather a liberal construction on such reports. "Doctors will differ," and, perhaps, it is right they should.

The question is often asked "Which is the best kind of saw mill to cut all kinds of timber?" I answer unhesitatingly the "Mulley saw mill." I rest my opinion on practical experience. I have used the sash in several mills, I have seen the circular saw cut in some of the best mills of the kind in the States, and they are the best mills to cut small timber, hard wood, or white pine of any size that one saw will cut. I have no faith in the double saw. I have used the mulley in several mills in this State and Indiana. I have seen nearly all the new kinds of cheap mills lately brought before the public, and none of them can compete with the mulley mill for cutting large, hard, and rough timber, and for quantity and quality of its lumber—the opinion of others to the contrary notwithstanding.

I have no faith in the statement of a circular saw cutting from 12 to 15 thousand feet in 12 hours—oak logs 8 feet long at that. A good average log—8 feet long—will make about 200 feet board measure. It would take about 75 logs, or between 600 and 700 cuts with the same number of runs back and sets, with 75 stoppages to put on and off logs in 12 hours. There are but 720 minutes in 12 hours, and this rate of sawing would be over 21 feet per minute from the time of starting at 6 A. M., to 6 P. M. I have had an interest in three mulley mills that cut about four million feet of lumber (8 feet oak logs, slabed and turned down) for the Glasgow and Huntsville plank road, in about 12 months sawing time by daylight; a great portion of the logs were small. It is true, we were over a year doing the work, but the mills were idle for want of water to make steam over half the time. The hands often tasked themselves to 5,000 feet board measure per day, and often finished it in 9 to 10 hours. I consider 3000 feet per day of hard lumber, with one set of hands, good work. It is as much as three hands—2 sawyers and engineer—can do, and keep up their mill in good order. Of white pine they could cut 10,000 feet just as easy. Our mills were made at Mount Vernon, Ohio, and are as good as any I have seen.

A new foundry at St. Louis is now building very good mulley mills; they are not quite as well finished as some mills which I have seen, but they are strong and durable—a very important item in a country where machine shops are few and far between.

Amongst some of the late improvements in saw mills is O. S. Woodcock's improved mode of hanging reciprocating saws. Patented Sept. 11th, 1855; illustrated in No. 8, Vol 11 SCIENTIFIC AMERICAN. I look upon it to be an invaluable improvement. Having seen it in use in a number of mills in Indiana, I was induced to purchase the right of using it in mills I was interested in here, and it has fully met my expectations from its simplicity and durability. I would recommend it to all using the sash or mulley saw mill, and no doubt it is just the thing for re-sawing boards.

Portable saw mills seem to be all the rage at this time in the Far West, where they build cities in the usual time it took to build a mill a few years ago; but all the new mills of the kind I have seen are so light and cheap that they are in a manner worthless, unless a man would purchase a foundry and machine shop with them. But why not build the good strong mulley mill on the portable plan. It can be built on the ground on a hillside, but a little elevated, or by digging a small pit in any situation. By using Woodcock's patent to a short pitman, say from 3 1-2 to 4 feet long, and driven by direct action, it will work without any perceptible friction on the cross head or slides. I shall give it a fair trial next spring and report. It would be a great saving of expense in some localities to dispense with the heavy two-story frame.

M. ENGLISH.

Glasgow, Mo., Nov. 1856.

Steam Pile-Driving Machinery.

The following account of driving piles by steam power is from the London *Mechanic's Magazine*, and will be of interest to our civil engineers. Our country would be more benefitted than any other on the face of the globe by improved spile-driving machinery, because more works of this character are executed in the United States yearly than in all the kingdoms of Europe put together:—

"Mr. Robert Morrison, of Newcastle-upon-Tyne, has patented a machine or apparatus for driving piles by the direct action of steam, by which two or more rows of piles may be driven simultaneously without the necessity for any lateral or transverse movement being imparted to the pile-driving mechanism, and consequently the expense of driving temporary piles and erecting platforms for the machine to traverse laterally upon, from one row of piles to another, is obviated.

According to this invention, one, two, or more steam cylinders and driving rams are employed, according to the number of rows of piles to be driven at one time, the distance between such cylinders and rams corresponding to the width between the centers of the rows of piles. The cylinders and valve gearing are carried in suitable supports on one end of a traveling carriage on wheels, and a vertical tubular boiler and small steam engine for hoisting the piles and raising the cylinders when they have each driven a pile, are carried at the other end of the carriage. The boiler is fitted with a conical or tapered fire-box, the contracted end being uppermost. As fast as each pile in a row is driven, the machine is traversed forward between the rows to the next piles, and so on until the whole of the piles in each row are driven. The driving rams are made solid, and the pistons are forged or cast in one piece therewith. A stuffing-box is fitted on to each end of the cylinders, and the driving rams work through both the stuffing-boxes, which thus serve as guides without the necessity for any other means of steadying them during working. The lower end of the ram, or that part which works through the lower stuffing-box, is made cylindrical, whilst the upper portion, working through the top stuffing-box, is made square, to prevent the ram from turning round. Or in place of making it square it may be first turned cylindrical, and then have one side planed off, or it may be simply fitted with a feather on one side; any other form, however, would answer other than cylindrical.

The valves of the steam cylinders are so arranged that the steam may either be admitted on the underside only of the pistons for raising the rams, and then allowing such rams to fall by their own gravity to drive the piles, or the steam may be admitted on each side of the pistons, so that the force of the blow may be increased in proportion to the pressure of the steam. In the former case the upper stuffing-box will not, of course, require packing, but will merely serve as a guide to the ram. The small steam engine which it is proposed to employ for raising the cylinders after they have done their work, and hoisting fresh piles to deposit under the rams, is an inverted trunk engine, the lower end of the trunk being flattened to such an extent as will balance the weight of the piston trunks and connecting rod."

At a late meeting of the Institution of Mechanical Engineers, held at Birmingham, the inventor read a paper describing his machinery, but no report of it has yet been published. If one is published hereafter we may refer to this subject again.

Geometrical Models.

Professor Gillespie, of Union College, N. Y., has obtained from Europe a series of models, fifty in number, composing a whole set belonging to the department of descriptive geometry. They consist of minute combinations of silk threads, extended by weights, and designed to represent ruled surfaces. The process of intersecting, transforming, &c., is said to be truly wonderful, and the workmanship is of the most exquisitely delicate character There are but three such sets in the world—one at Madrid, one at Paris, and that at Union College.

The Friction of Machines.

We often receive communications requesting information relating to the friction of certain machines, such as the amount of friction in an air pump, or the amount in a steam engine per horse power. It is impossible for us to answer such questions in the affirmative; we cannot tell the amount of friction engendered in any specific machine. The fact is, that of two machines alike in every respect, but in the manner in which the work is executed, the one may cause double the amount of friction of the other. A steam engine may be so badly constructed as to expend its whole steam power in overcoming its own friction. The engine that embraces the best proportions, the smoothest working surfaces, and the finest joints will give out the greatest amount of power. A great amount of power is consumed in all machines in overcoming friction; and if it were not for the use of some lubricating material to obviate friction in the journals and joints of machines, it would not be possible to operate some machinery at all, because the friction engendered would absorb all the power. Friction in machines varies with the nature of the rubbing bodies. Bourne in his work on the steam engine, says:—

"The friction of iron sliding upon iron has generally been taken at about one-tenth of the pressure, when the surfaces are oiled and then wiped again, so that no film of oil is interposed. The friction of iron rubbing upon brass has generally been taken at about one-eleventh of the pressure, under the same circumstances; but in machines in actual operation, where a film of some lubricating material is interposed between the rubbing surfaces, it is not more than one-third of this amount, or 1-33d of the weight. While this, however, is the average result, the friction is a good deal less in some cases. Mr. Southern, in some experiments upon the friction of the axle of a grindstone—an account of which may be found in the 65th volume of the Philosophical Transactions—found the friction to amount to less than 1-40th of the weight; and Mr. Wood, in some experiments upon the friction of locomotive axles, found that by ample lubrication the friction might be made as little as 1-60th of the weight. In some experiments upon the friction of shafts by Mr. G. Rennie, he found that with a pressure of from 1 to 5 cwt. the friction did not exceed 1-39th of the pressure when tallow was the unguent employed; with soft soap it became 1-34th. The fact appears to be that the amount of the resistance denominated friction depends, in a great measure, upon the nature of the unguent employed, and in certain cases the viscidity of the unguent may occasion a greater retardation than the resistance caused by the attrition. In watchwork, therefore, and other fine mechanism, it is necessary both to keep the bearing surfaces small, and to employ a thin and limpid oil for the purpose of lubrication, for the resistance caused by the viscidity of the unguent increases with the amount of surface, and the amount of surface is relatively greater in the smaller class of works.

The nature of the unguent, proper for different bearings, appears to depend, in a great measure, upon the amount of the pressure to which the bearings are subjected—the hardest unguents being best where the pressure is greatest. The friction of lubricating substances is to prevent the rubbing surfaces from coming into contact, whereby abrasion would be produced, and unguents are effectual in this respect in the proportion of their viscidity; but if the viscidity of the unguent be greater than what suffices to keep the surfaces asunder, an additional resistance will be occasioned; and the nature of the unguent selected should always have reference, therefore, to the size of the rubbing surfaces, or to the pressure per square inch upon them. With oil the friction appears to be a minimum when the pressure on the surface of a bearing is about 90 lbs. per square inch. The friction from too small a surface increases twice as rapidly as the friction from too large a surface, added to which, the bearing, when the surface is too small, wears rapidly away."

Manufacture of Glass in England.

The greatest stimulus ever given to the glass manufacture of England was the abolition of the duty on it in 1845. That abolition has produced a somewhat paradoxical result.—While the quantity of glass made has increased in the proportion of three to one, the number of manufacturing firms has diminished in the proportion of one to two. In 1844 there were fourteen companies engaged in the manufacture. In 1846 and 1847, following the repeal of the duty, the number had increased to twenty-four. The glass trade, after the removal of the heavy burden imposed upon it, seemed to open a fair opening for money-seeking investment. The demand for glass was so great that the manufacturers were in despair. Glass-houses sprang up like mushrooms.—Joint stock companies were established to satisfy universal craving for window panes. And what was the result? Of the four-and-twenty companies existing in the year 1847, there were left, in 1854, but ten. At this time there are but seven in the whole United Kingdom. Two established in Ireland, have ceased to exist. In Scotland the Dumbarton Works, once famous, were closed in 1831, by the death of one of the partners, afterwards re-opened, and again closed. The seven now existing are all English.

[The above extract is from the London *Builder*. The manufacture of the finer kinds of glass was introduced into England not many years ago from Germany, and German operatives were employed, at very high wages. We understand that the English glass is now superior to the German. There is only one plate glass factory in the United States; it was commenced only two years ago near this city, and we understand that it has met with encouraging success.

A Rare Fossil.

The fossil department of the British Museum has received a valuable addition in the entire skeleton of the rare species of a gigantic wingless bird, recently described by Professor Owen under the name of *Dinornis phantopus*. This is stated to be the only specimen of Dinornis in which the skeleton has been reconstructed from the actual bones of one and the same individual bird.

Labor-Saving Soap.

Dissolve a quarter of a pound of lime in a gallon of cold water, then take off the clear; dissolve half a pound of sal soda in a quart of water, and mix it with the clear lime water. One pound of brown soap dissolved in a gallon of water is then to be added to the clear liquor formed with the sal-soda and lime water, and this forms the soap. This soft soap is excellent for boiling white linens; it removes all grease that is in them, because it contains an excess of caustic lye. About one quart of it is sufficient for boiling clothes in a ten-gallon wash kettle. A quantity of this may be made up and kept for constant use.

How Wind Produces Cold.

Winds produce cold in several ways. The act of blowing implies the descent upon and motion over the earth, of colder air, to occupy the room of that which it displaces. It also increases the evaporation of moisture from the earth, and thus conveys away considerable heat. This increased evaporation, and the mixture of warm and cold air, usually produce a condensation of vapors in the atmosphere; hence the formation of clouds, and the consequent detention of the heat brought by the rays of the sun. And whenever air in motion is colder than the earth, or any bodies with which it comes in contact, a portion of their heat is imparted to the air.

A new ship of war is being built at East Boston for the Viceroy of Egypt. She is 216 feet long, 37 wide, and 21 feet deep, and is to be ship rigged. She is intended as a yatch for the Viceroy of Egypt, who had her built in the United States upon the presumption that he would obtain a better model for speed than could be produced in either England or France. The framiug is mostly iron.

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New Inventions.

Machine for Grinding Saws.

On the 23d of September last a patent was granted to Albert S. Nippes, of Manyunck, near Philadelphia, Pa., for a machine for grinding saws. Last week the inventor was in this city, and exhibited to us a working model of his invention, and it is, undoubtedly, a good machine for this purpose. The object of the improvement is the grinding of saw plates positively correct—a result which has always been very difficult to accomplish, owing to the wearing away of the stone while grinding.

In this machine there is a self-adjusting pattern, used for giving shape to the saw plate by causing a face plate, or the grindstone to approach or recede from one another to vary the bevel or thickness of the saw plate, and to compensate for the wearing away of the stone while grinding. All the devices and parts of this machine are simple, and we should suppose that it would be likely to meet the wants of saw manufacturers in every part of the world, and come into general use. Manufacturers of saw plates should give it a careful and candid examination.

Hand Printing Machine.

This illustration is a perspective view of a small and neat hand machine for printing. Its object is to print letter after letter, as a substitute for writing with pen and ink, and the devices combined to execute the printing continuously in lines, are ingenious.

A is a circular case, with a plate or cover inside, which has an opening in it for the sliding lever post. B is a hollow base plate, supporting all the parts. C is a circular rim around the top of the case. The letters of the alphabet, numbers, punctuating marks, and spaces are laid out regularly around it, stamped or printed. There is an indent under the rim below each letter to receive the pointed end, *c*, (which is the fulcrum in pressing) of the impressing lever key, D, which is pressed down to make each impression. This lever is secured on a transverse axis pin, *e*, passing through the vertical sliding post, E. There is an inking roller, F, at each side. The two rollers are set on a vibrating step, G. Their faces are broad, so that by raising one and depressing the other gradually their extended surface supplies ink for a considerable amount of printing.

H is a type wheel secured on the sliding post, E, and is moved around, conjointly with the position of the lever, D. The type are secured at proper distances apart, between two rims. Each letter is so arranged that when the lever, D, is pressed down, the letter on the type wheel corresponding to that on the rim, C, against which the point, *c*, is forced upwards, will be impressed on the sheet of paper, P.

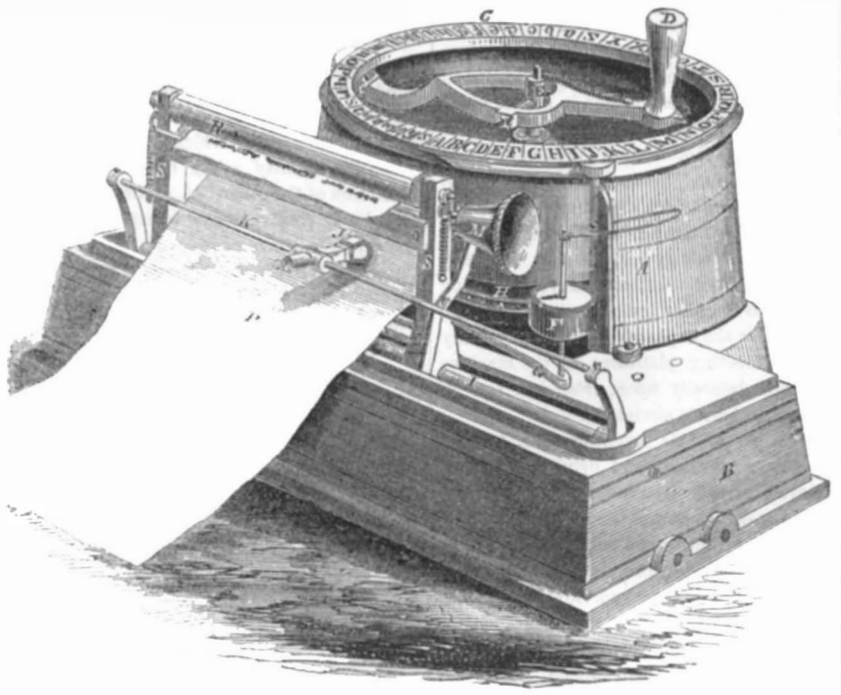
I is a vibrating axis extending across the machine. It is operated by a bell crank on the foot of the sliding post, D, as it is pressed down. J is a platten cushion, which forces the paper against the type wheel, H. The paper passes between two guide rollers, R, which hold it by springs snugly between them. The paper, P, the rollers, R, and their standards constitute a small frame that is fed across the machine to print line after line of letters separately, forming words and sentences when printed. The standards, S, of the rollers, R, slide along axis I, and traverse the distance for each letter by each motion of the key lever, D. When one line is printed, the paper is turned round the exact distance for another line, by turning the top roller, R, one notch of its pinion, M; the small frame of the rollers are then pushed to the other side by hand, and the machine is ready to print another continuous line, by simply vibrating the key lever, D.

Operation.—Bring the point, *c*, into the indent under rim, C, below the letter desired to be printed on P, and press down on D; the sliding post, E, is then forced down, (*c* being the fulcrum of the lever,) and a spring lever on the foot of this post, inside, connected with an arm to the shaft, I, vibrates it, drawing forward the impressing cushion, J, and forcing the paper against the projecting type, similar to the one on C, above the point, *e*, and thus the impression is made.

When the lever, D, is released from the pressure of the hand, a spring throws back the impressing cushion, and the paper is released, and at the same time moved across a certain space to receive the impression of a new letter, and so on continuously. The feeding of the paper across is caused by a small cord passing over two small pulleys underneath, one pulley having a small notched wheel on it, into which a spring click takes, and which, as it is released and caught by arm K, vibrating, it moves the paper like the slide of a lathe. A band of paper of any length may be used on this machine, and the printed portion can be read as it is being fed out, as shown.

The types used are the common kind, and can easily be replaced when worn out The

COOPER'S HAND PRINTING MACHINE.



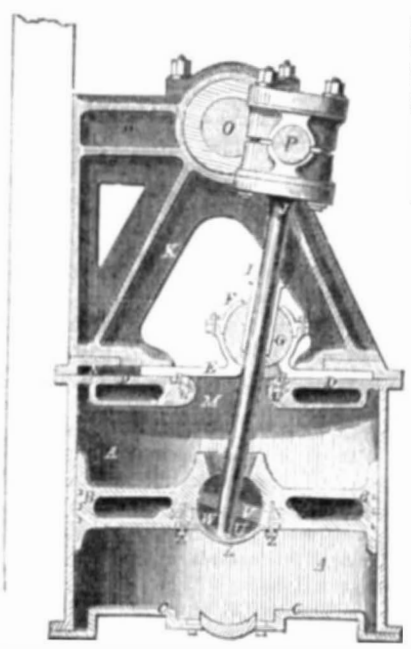
mechanism for moving the paper is very simple and ingenious. The type wheel is supported on, and revolves on anti-friction rollers underneath, so that the operation of working it is very free and easy.

This machine is well adapted to meet the wants of the community for various purposes. It can be brought into service in villages, in getting out hand-bills, notices, or labels of any kind, and forms a very instructive mode of teaching young persons to spell, punctuate, compose, &c., because they can reproduce, at pleasure, in printed form, essays in prose or verse.

Patented May 20th, 1856.

Any information concerning these machines may be obtained by addressing or calling on Charles Bradfield, at his Agricultural and Mechanical Emporium, Fifth and Chestnut sts., Philadelphia, or from the patentee, John H. Cooper, No. 486 North Sixth st., Philadelphia, Pa.

Improvement in Steam Engines.



The form of engine shown in the accompanying illustration is proposed as a substitute for the oscillating, trunk, and other kinds of engines designed for the purpose of economising space, and bringing the crank shaft closer down to or nearer to the cylinder. For marine purposes, and particularly for working the screw propeller, the advantage sought to be attained is known to be of the first importance. In this invention a cylinder of the ordinary form used for fixed cylinder engines is employed, but instead of using the ordinary cylinder cover, piston, and piston rod belonging thereto, a cylinder cover is substituted of the following description:—

The cover of the cylinder (the top part of which is surfaced,) has an annular recess accurately bored out for to receive an annular ring of metal, as also the hemp or other packing, and the springs or other elastic material; on the top of the cover is a metal sliding piece, which when the engine is in motion slides from one side to the other during the revolution of the crank shaft; the top part of the sliding piece is formed with a spherical concavity to receive about one-half of a sphere, which is partly covered by a gland; the sphere contains a stuffing box bored to the required depth; the hole being afterwards continued through must be the exact size of the piston rod, so as to allow of its passing through it. In the cylinder cover is a hole sufficiently long to allow of the oscillation or vibration of the piston rod, and which opening must be rather wider than the diameter of the piston rod. To the flange of the cylinder is bolted a circular plate or cover, as before described, and a space being provided for the sliding piece, which slides backward and forward during the revolution of the crank shaft between a metal ring (the inside of which is perfectly planed and made accurate) and the cylinder cover. The piston rod is connected to the crank pin in a manner similar to that used in oscillating engines, by a T-headed block with brasses, and the other end is connected to the piston in the following manner: The end of the piston rod is turned slightly conical, to fit into a corresponding hole bored in the boss or spherical part of the ball joint, gudgeon, or axle, and is firmly retained there by a cottar, which cottar passes through the boss and is retained by pins, thereby preventing it from sliding back. One half of the bottom ball joint, gudgeon, or axle attachment is fitted into a recess in the piston, and is retained there by a cover, which is made to fit perfectly close, and is securely held down by bolts, which bolts are prevented from unscrewing by a guard frame, which may also be secured by bolts or otherwise; the joint between the flange and the piston may be kept tight by means of a vulcanized india rubber washer. The illustration shows a vertical section of a marine screw engine. A A is the steam cylinder; B the piston; C the cylinder bottom; D the cylinder cover, the top part of which is surfaced for the metal piece, E, to slide upon; F is the metal sliding piece, which is formed with a spherical concavity to receive about one half of the sphere, G. F is a gland to secure the sphere in the concavity, and which will be seen does not completely cover the sphere, G. G is the sphere, which works in a spherical concavity in the sliding piece, E. K is the iron framework, bolted to the circular plate on cylinder cover for supporting the crank shaft, O. I is a gland, through which the piston rod, J, passes which is packed as usual; J the vibrating piston rod. In the circular plate or cover bolted to the top of cylinder, A, is a space, N, being provided to allow the plate, E, to slide backward and forward; L is a metal ring, one part of which is secured by bolts to the circular plate, and the other part is in contact with the sliding piece, E. M is a hole in the cylinder cover sufficiently long to allow of the oscillation of the piston rod, J. N is a space between the metal ring and the cylinder cover, D, in which the sliding piece moves; O is the crank shaft; P is the crank pin; R is the hemp or other packing; S the springs or other elastic material, which are let into an annular recess in the cylinder cover, D. P is the crank pin, to which the vibrating piston rod, J, is attached by T-headed brass bearings, or a block fitted with brasses; U the end of the piston rod, J, which is turned slightly conical to fit into a corresponding hole bored in the boss or spherical part of the ball joint, gudgeon or axle, W. V is a cottar, which passes through the boss and conical end of piston rod, and is retained by cross pins passing transversely through it, thereby preventing it from slipping back; X is a cover piece on the under side of the piston, and which serves to retain the ball joint, gudgeon, or axle, W, the closeness of which can be adjusted by the bolts, Y. Z is an india rubber washer, placed between the nut and the cover. In the illustration the gland of the piston rod is being held down and tightened by means of two bolts at the sides thereof, but a screwed gland may be substituted therefore, and fitted into the stuffing box, and which may be set down by means of notches or teeth formed on the head of the gland piece, into which a suitable spanner will take. It is also proposed, when necessary, to form the annular rings, slides, and fittings on the cylinder cover with a double step or break in section, so as more effectually to check and prevent the escape of steam.

[This illustrated description is from the London *Engineer;* the improvement has been secured in England by patent, granted to W. Young. The importance of bringing the crank shaft as near to the cylinder cover as possible is very desirable, and many contrivances for this purpose have been designed; this is one object of the oscillating cylinder and the trunk engine. The objections to the oscillating engine are, that the whole weight of the cylinder and adjuncts must be put in motion every stroke, thus throwing considerable strain on the piston rod and crank, and it is also asserted, they cause a torsive action of the whole engine, especially when it is a large one, like an oscillating marine engine. The advantages of the oscillating engine are designed to be obtained by this improvement, while its evils are obviated. The trunk engine has but a small area of piston—an evil not belonging to this one, while its advantages are obtained. The improvements here claimed, therefore, deserve general attention by our engine builders.

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For the largest List,	$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st of January, 1857.

☞ See Prospectus on last page.

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Scientific American.

NEW YORK, DECEMBER, 6th 1856.

Opponents of the Woodworth Patent Extension.

Are you really aware of the fact that no effort is to be left unaccomplished to get this odious monopoly extended by an act of Congress within the next three or four weeks? Yet such is the fact, and it will surely be done if influence, money, and unscrupulous intrigue can do it. Silently and yet powerfully are these schemers at work, infusing their unholy desires into the minds of Members of Congress. This needs to be counteracted at once, and to do it with success a good and reliable man should be stationed at Washington to watch every movement of the extensionists, and ready, with reasons of justice and sound argument, to meet and expose their progress. This can and should be done without a moment's delay. A few hundred dollars, judiciously used, will secure the outside influence of some ex-Member who understands all the ropes in this Congressional ship, and could pull them with great service at this particular juncture.

This we consider a hateful business, but parties who oppose the extension upon principle, without pecuniary interest in it either way, cannot afford to spend their time and money to the neglect of other duties, in attending to this needful work. If there was ever a work in which we feel a pride to cooperate, it is in opposing this extension. We feel that our consciences are thoroughly enlightened upon this subject, and if there is any honesty in the professions of public men, this foul blot can never stain the annals of our legislation.

The dominant party in Congress professes to be antagonistic to special legislation for the benefit of monopolies that crush, or in any way interfere with the true interests of the people. Now if there ever was a case which comes properly under this head, it is the Woodworth Patent Monopoly. It has been held up as a terrifying ogre to every inventor who has succeeded in inventing a planing machine, and by a most studied system of ruinous litigation to individuals—no one has been able to withstand the desperate assaults of the monopolists. With Letters Patent in hand, twice extended, and once re-issued, with no credit to those who participated in it, and with a monopoly yielding hundreds of thousands every year—it requires no great keenness of perception to see exactly how inventors of planing machines, and small manufacturers of lumber, are made to succumb. It is like one man, with a single blunderbuss, undertaking to rout a whole regiment of well drilled troops, supplied with all needful munitions.

We feel, now, that something earnest should be done, and if done, done quickly, to prevent the extension—if possible before the patent expires on the 26th of this month.

We are totally averse to any active participation in schemes to defeat it at Washington, and should prefer that some other person would undertake the job; but if there is no other way, we will not only contribute fifty dollars in money, but will also go on to Washington and work personally, if other parties will come forward, and aid by their contributions.

Not a moment must be lost. Shall we have any responses to this appeal?

Since the above was in type we have received a letter from a correspondent in the interior of the State, from which we extract the following.—

"My object in writing you now, is to advise you of a deep laid plot for the extension of the Woodworth Planer. There has been a Convention held of the owners and users of these machines, and I am creditably informed that they have signed a petition asking for its extension, and as a consideration, they are to have the exclusive right or monopoly in the county, town, or village where they are located. *It is intended that if* $100,000 *will get the extension, the trap will be sprung when Congress meets. That's the game.*"

Our correspondent has hit it exactly. Should this diabolical scheme succeed, hundreds will be ruined for the benefit of a few—then there will be no peace from litigation to those who now, or may hereafter, run planing and wood molding machines, unless tribute is paid to the monopolists. Let every opponent of the extension lose no time in getting a letter of warning into the hands of the Member of Congress from his respective district.

Ancient and Modern Water Works and Tunnels.

We are liable to forget the great works of past in our admiration of those of the present age, hence it is a good thing sometimes to recall what the old engineers have accomplished, as a healthful stimulant to excite our modern engineers to greater efforts.

The old Roman aqueducts for supplying that city with water in the days of its glory, when compared with the greatest of modern works of this kind, dwarf them into insignificance. Rome had one aqueduct—Aqua Apia—ten miles long, all underground; another—Anio Vetus—forty-three miles, and nearly all underground also; another—Aqua Marcia—fifty miles long, and the Anio Nevus fifty-nine miles long, with arches 109 feet high. There were also four other acqueducts, amounting to nine altogether, for supplying Rome with water by gravitation, for there were no steam engines in those days to pump it up from the adjacent river Tiber for city use, as is now done at Philadelphia, Chicago, Cleveland, and others of our cities.

The noblest work of modern engineering for supplying any city with water is, undoubtedly, the Croton Water Works of New York. Its artificial tunnel is carried over valleys, through hills, and over rivers a distance of forty miles. The work is stupendous, to be sure, for it carries a condensed river from the mountains into the city, but compared to the old Roman water tunnels it is not so much to boast of.

The city of Montreal has recently finished some great works of engineering for supplying itself with water in the same manner as the city of Philadelphia, by employing the water power of the river to pump itself up to an elevated reservoir. The water from the St. Lawrence, immediately above the rapids, is conducted by a canal five miles long to a basin, where two large wheels, 36 feet in diameter, work force pumps, which drive the water through iron pipes for about three miles to a double reservoir situated on the mountain behind the city, at a hight of 200 feet above the river level. These reservoirs contain 20,000,000 gallons, and were cut out of the solid rock. Thus from the elevation of 200 feet the water is conducted through the whole city. Next to the Croton Water Works, the Water Works of Montreal, we understand, are the greatest of the kind on our continent

From present indications there are a number of cities in the United States which will yet surpass Old Rome in extent and population, and which must be supplied with water from distant sources. As no city can be kept clean and healthy without a good supply of water, we tell them to look to old Rome for encouragement and an example.

Some great works of tunneling, or boring through mountains, have, within a few years, been executed in Europe and in our own country, for carrying railroads through them, and the tunnel now boring through the Green Mountains, three miles long, is considered to be the most expensive work of the kind ever attempted by our engineers; but we have only begun to execute works of this kind, and we require to be stimulated. The Alleghanies, the Rocky Mountains, and other mountains have yet to be tunneled to make pathways through them for the "iron steed." Look at what the old Romans did. They cut a tunnel as part of a drain for Lake Fucinus, and it was bored one mile through a mountain of hard cornelian. It was in the form of an arch nine feet wide and nineteen feet high. There was no gunpowder then, to assist the miners in blasting; all the work of cutting was executed inch by inch by steady labor with the pick, wedge and chisel. Considering the amount of labor required for this work, our engineers have much to incite them, for if the Romans did accomplish such works with their defective tools and means, what great works of tunneling should not our engineers be able to execute with gunpowder for blasting and the steam engine for cutting.

The Days before Coal.

There can be no doubt, for it is an unquestionable fact, that the coal beds of England are the real natural source of its physical wealth. Without coal, it never would have been a manufacturing country; without it no cotton factories would ever have been erected, and no steamships would ever have floated on its waters. It is simply because it has the largest coal fields in Europe, that it is the greatest manufacturing nation in that quarter of the world. But it was very difficult to introduce the use of coal among the old English people.

It was first used in that country about six centuries ago, and at that time Englishmen would not use the *sooty fuel* in their houses. It did not suit the fire-places or the domestic habits of the people; but it was found well adapted for the blacksmith and the lime-burner. Only the layers near the surface and in coal fields adjacent to rivers or seas, were first opened; but when the demand increased, the miners dived more deeply into the bowels of the earth, and boldly worked the coal wherever it was to be found. When the mines became deep, the miners were sadly perplexed how to get rid of the water; and it was not till the steam engine came to their aid that they fully mastered this difficulty. But the prejudices of the users were as difficult to surmount as the perils of the miners. A citizen of London was once tried and executed for burning sea coal, in opposition to a stringent law passed in respect to that subject; but even long after such intolerance as this had passed away, coal was *tabooed* in good society. Ladies had a theory that the black abomination spoiled their complexion; and it was for a long time a point of etiquette not to sit in a room warmed by a coal fire, or to eat meat roasted by such means. Prejudice unquestionably had much to do with these objections; but it was not all prejudice, for the almost total absence of proper arrangements for supplying fresh air, and removing smoke and foul air, rendered the burning coal a very dirty and disagreeable companion in a room.

Wood was then the principal fuel used in England, and the forests but scantily supplied the wants of the people. Turf or peat was also employed in some districts as it still is in Ireland and in the Highlands of Scotland; but in all England wood is at present unknown as a domestic fuel—coal has entirely superseded it.

Time, Space, and Power.

Persons who have not studied the principles of mechanics, often deceive themselves with regard to the power of levers and wheels; and many men of an ingenious turn of mind have spent time, money, and labor, in designing and constructing machines, to gain power by levers, wheels, and pulleys. No power can be gained by any arrangement of such devices. The power of any machine is the force which sets and keeps it in motion; the levers, wheels, and pulleys are only mechanical devices for transmitting the power to some other point, whether it be for the hoisting of barrels or boxes, by block and tackle, the turning of a locomotive driving wheel, or the paddles of a steamship. By the use of a lever a man can raise a greater weight than he can by hand, but he could raise this weight in the same time, by hand, if it were divided into two or more parcels. This is an immutable law of mechanics. No man who understands it will ever engage in the futile search for a perpetual motion.

The Construction of Chimneys.

We often receive communications requesting information as to the best mode of building chimneys. A few simple rules are sufficient to guide any person in the construction of a chimney. The higher the chimney the better its draft. It should be made of good non-conducting materials like brick, because the warmer it can be kept from the base to the top, the better will be the draft, as it is the heat of the gases which causes them to ascend. If the gases were condensed in the inside of a chimney, its draft would be destroyed. The flue of a chimney from an engine boiler, should never be run underground unless it is drained beneath, because it is liable to absorb moisture from the ground, and thus absorb the heat, and injure the draft. As it is convenient in some instances, thus to construct the flues of furnace at some distance from the chimney,—this information will be useful to those who require such arrangements. The inside of a chimney should be made as smooth as possible, so as to offer little resistance to the ascent of the heated gases, and also for the purpose of having few projecting surfaces for the adherance of soot.

Mechanical Clarionet Player.

One of the most ingenious pieces of mechanism which we have ever witnessed, is the invention of a Belgian, by the name of Van Oeckelen, who is exhibiting his wonderful novelty at the Chinese Museum, Broadway, this city.

A fine proportioned human figure, dressed as a Troubadour, stands erect in the center of a room, holding in his hand a clarionet of ordinary appearance and construction. The operator of the Automaton raises the skirts of the wax gentleman's coat, and applies a key to wind up the magician, whose nerves, cords, and whole vitality, in fact, consists of two sets of mechanism, one of which performs the respiratory or blowing feature, and the other operates the figure, and controls the action of the fingers on the keys of the instrument. The grace and ease with which the "machine man" moves his body from one side to another and bows to his admiring audience, is remarkable, and the dexterity with which he fingers the keys in quick music, is not surpassed by any human player we ever saw perform.

We were permitted to witness the movements of the mechanism as the automaton was playing, and the perfection with which it is constructed, and the diversity of its complicated movements, show the inventor to be a most skillful mechanic, as well as possessed of wonderful originality as an inventor.

For ten years Mr. Van Oeckelen labored incessantly in the construction of this piece of mechanism, spending a fortune of $60,000 in conducting his experiments and producing his automaton. While we deprecate as folly the waste of such skill and so much time and money on a mere toy, we cannot but admire the patience with which Mr. Van Oeckelen prosecuted his labors till the end he sought had been accomplished.

At some future time we may give a description of the mechanical construction of the Automatical Clarionet Player; but to our city readers who have a taste for beholding wonderful mechanical contrivances—and who of them has not?—we would recommend to call and see the "Machine Man," and the man who made the machine, both of which are subjects of interest.

An Ether Steamship Burned.

News from Bahia, (South America,) give an account of the burning of one of the French combined steam and ether ships, named *La France*, in that harbor in the month of October last. The ether could not be kept in the liquid state in that warm climate; it escaped in great quantities from the tanks in which it was contained, caught fire, and burned up the entire vessel.

Ether boils at 96° Fah., therefore it was exceedingly stupid for those who had charge of that vessel to carry ether with them into such a climate, where the water in the bay often ranges at a temperature of 100°. In such a climate ether would boil in casks in the hold of any vessel. And in this steamer it could not be employed as a motive agent at all, because it had to be condensed at every stroke of the engine, requiring for this object water as low as 48° to produce an economical result.

The American pistol with which Col. Hay of the British Army executed such accurate shooting at 300 yards distance, as noticed by us last week, is that of Smith & Wesson, of Hartford, Conn.

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The Philosophy of Fascination.

"The power possessed by serpents to fascinate birds has always been (says Dr. Braid, a foreign author,) a source of interest and admiration to the curious. That a crawling reptile, such as a serpent, doomed to move pronely on the earth, should possess the craft and power, by the mere fixed gaze of its glaring eyes, irresistibly to draw down birds, seems to proclaim this as one of the most remarkable of nature's laws. The question, therefore, arises, by what means is this remarkable result effected? Is there any magnetic attraction in the eye of the serpent by which the bird is drawn? Or is it the result of any poisonous emanation projected by the serpent? Is it a voluntary or an involuntary process by which the creature approaches and falls an easy prey to its fell destroyer? After due consideration I feel satisfied that the approach and surrender of itself by the bird or other animal, is just an example of the *monoideodynamic*, or unconscious muscular action, from a dominant idea possessing the mind, which I first published as the true cause of 'table-turning.'

The law upon which these phenomena are to be explained has long been familiar to me, from observations made during my investigation of hypnotic and mesmeric phenomena, and it is simply this: that when the attention of man or animal is deeply engrossed or absorbed by a given idea, associated with movement, a current of nervous force is sent into the muscles which produce a corresponding motion, not only without any conscious effect of volition, but even in opposition to volition in a great many instances; and hence they seem to be irresistibly drawn, or spell-bound, according to the purport of the dominant idea or impression in the mind of each at the time. The volition is postrate; the individual is so completely monoideized, or under the influence of the dominant idea, as to be incapable of exerting an efficient restraining or opposing power to the dominant idea; and, in the case of the bird and serpent, fear causes that monoideo-dynamic action of the muscles which involuntarily issues in the advance and capture of the unhappy bird. This is the principle, moreover, which accounts for such accidents as are frequently witnessed in the streets of every crowded thoroughfare, where some persons, when crossing the streets amid a crowd of carriages, not only become spell-bound by a sense of their danger, so that they cannot move from the point of danger, but it even sometimes happens that they seem impelled to advance forward into the greater danger from which they are anxious to escape, and from which a person with self-possession or presence of mind may be fired, by the very sense of his danger, to escape by making an incredible bound—his natural powers having become stimulated to unwonted energy by a lively faith as to his capability to accomplish such a feat.

It is also upon the same principle that some individuals may be brought so much under the control of others, through certain audible, visible, and tangible suggestions by another individual, as is seen in the phenomena exhibited in the waking condition, in what has been so absurdly called "electro-biology." The whole of these phenomena come under the same category, namely, the influence of a dominant idea, or fixed act of attention, absorbing, or putting in abeyance for the nonce the other and great controlling power of the mind—the will." This explanation of fascination is very clear and philosophical.

Explosion of a Ship by Coal Gas.

The English papers contain accounts of a recent singular and dreadful explosion of a Russian ship, caused by spontaneous generated coal gas. The vessel was lying in Cardiff Harbor, Wales, loaded with bituminous coal. The hatches had been on all night against orders, and it seems that quite a quantity of carburetted hydrogen gas had accumulated in the hold. A coal trimmer early next morning went down with a lighted candle, when the gas—which had been saturated with air—took fire, and a terrific explosion ensued. It being quite dark at the time, the sheet of flame was seen ascending to a great hight, while the blazing fragments of the wreck shot through the air like rockets; the adjacent dock and the rigging of the ill-fated vessel took fire. One man was instantaneously killed, and eleven of the crew dangerously wounded.

Some idea of the force of the explosion may be formed from the fact that one of the anchors, weighing about 35 cwt., was blown over the forestay, from 15 to 18 feet high; it then fell into a barge alongside, which it sunk. The maintopmast was blown away, and, in fact, the vessel was nearly blown to pieces; not a vestige of the deck remained, and she sunk in about 12 feet of water. The windows of several houses on the dock were broken, and the report of the explosion was heard at places four miles distant.

Important Patent Case.

Knitting Machine.—An important patent case was decided in the U. S. Circuit Court at Providence, R. I., on the 24th ult., Judge Curtis presiding. The parties were J. S. Winsor against Kendall and others, for infringing the plaintiff's patent, granted for a harness knitting machine, on the 2nd of January, 1855.

The case is an uncommon one, and we call the attention of manufacturers and inventors to it, as it relates to the use of machines, constructed before the patents for them are issued. The plaintiff charged defendants with an infringement of his right, in using (after his patent was granted,) ten machines constructed by them before his application for that patent. The point of defence was, that the plaintiff had, in legal effect, licensed the making of these machines; and the question presented to the jury under the Court's charge was, "Did the defendants construct their machines under the belief, authorized by the plaintiff, that he consented and allowed them so to do?" A verdict of $2000 damages was given to the plaintiff by the Jury in half an hour after the case was submitted to them.

India Rubber Car Springs.—In the U. S. Circuit Court, Boston, on the 28th ult., an injunction was granted against Thomas Wason, car builder, of Springfield, restraining him from issuing or selling any Vulcanized India-Rubber Car Springs. This injunction was asked for by the New England Car Spring Co., to prevent the making, using, or selling of Vulcanized Rubber Car Springs made by the Union India Rubber Company, of New York, it being an infringement of the patents owned only by the New England Car Spring Company.

Tempering Steel Tools.

Great care and experience are required in tempering tools, because they are so liable to crack when plunged into the cold water bath. When they are heated to the tempering point, which is known by their color—yellow for a hard and blue for soft temper—their surfaces should be rubbed over with a paste of the prussiate of potash, before plunging them into the water. File makers draw their files, after they are taken from the fire, throug the lees of beer or a mixture of salt and the hoofs of animals ground into powder, before they immerse them in the water bath. Some tool makers dip their tools in strong soapsuds, before plunging them into cold water. Steel rollers are tempered by heating them up to a red heat, then covering their surface with a paste of prussiate of potash, and placing them in the cold water bath. Steel rollers are very difficult to temper. The liability of steel articles to crack in tempering is owing to the sudden chilling and contracting of the molecules at the surface, while the interior molecules are still expanded and hot. To prevent this evil, the coating of the surface of tools with soap, grease, prussiate of potash, &c., before plunging them into the cold water bath, has been found successful in practice, but the reason why is not very well known.

A Great Bell.

A monster bell has been cast for the clock tower at the Palace at Westminster. It weighs 33,850 lbs.—15 tuns 50 lbs. Its mouth is 9 feet 5 1-2 inches in diameter, and it is about ten inches thick. It is the largest bell in the world, excepting the famous one at Moscow, in Russia.

Black Band Iron Ore.

A correspondent of the Philadelphia *Ledger* describes recent discoveries of the above famous ore at McKean Co., Pa.

"Black Band iron ore is found in Scotland, and has obtained celebrity for the peculiar quality of the metal it produces. It makes iron which is much more fluid when molten than any other, and therefore it makes casings much finer, and with less weight of metal.

The closest search has been made for it in America—but up to the month of October of this year, it had not been found of such extent and quality as to be worthy of remark.

But in October, 1856, Profs. Owen, of Indiana, and Newham, of Lackawanna, while examining the new bituminous coal in McKean county, Penn., discovered the regular seam of this most valuable mineral, forming the roof of a five foot vein of cannel coal, and giving undoubted evidence that it covers a great portion of that coal field. They suspected that some of the slates of the coal veins might be saturated with iron, because in no part of our State is limestone of other varieties so plentiful as in McKean county. The vein is five feet thick, and one bench of it, eighteen inches in thickness, yields, by the analysis, 43 1-2 per cent. of iron."

Questions for Solution.

When the London "Royal Society" was first instituted, Charles II., who loved a joke, proposed to the *savans*, its members, a very scientific question for solution. It was this: 'What is the reason that when a fish is placed in a basin full of water, none of it overflows?" After bothering their brains for weeks to discover the cause of this phenomenon, Sir Christopher Wren, the architect of St. Paul's cathedral, says to the witty monarch, "Is your Majesty, quite certain that none of the water overflows, when the fish is put into the basin?" "Ah, there you have it," said Charles, "I do not know."

There are too many persons who, without the humor of Charles, ask just as absurd questions.

Old Silver Coin.

The Bangor, Me., *Journal*, gives an account of some very antique coins recently found in a sand bank near that city. Some workmen in digging on the bank of the Kenduskeag stream, turned out a deposit of silver coin, amounting to about $40 in value. These coins are of the size of a sixpence and a common cent. On one side is a head, and on the other an Indian with bows and arrows, and one star. The money is quite thick and very imperfectly trimmed, having no finish upon the edge.

Steam for Raising Ships.

France seems to be a long distance behind America and England in the use of steam power for raising great bodies in the dock-yards. At the Imperial dock yard at Cherbourg, they still raise the vessels on the stocks for repairs by capstan and hand labor. A short time since a line-of-battle-ship was raised for repairs, and no less than 700 men, manning six capstans, were employed for seven hours to accomplish this work. By the use of a steam engine of 70 horse power, the same work could have been performed with only a few attendants, in four hours.

Photography in Paris.

The city of Paris alone contains one hundred and ten establishments exclusively occupied in the manufacture of materials used by photographers, and some of them employ one hundred and thirty workmen. There are seven hundred photographers in Paris, some of whom execute eighty to a hundred portraits a day by each photographer, costing 15 cents each, and sold at an average of six dollars. The stereoscope is also a branch of photography, in which one Parisian firm has accumulated $120,000.

Trial of a Railroad Conductor.

A. F. Hoppel, the Conductor of the excursion train on the North Pennsylvania railroad, which came in collision last summer with a down train, and by which about fifty persons were killed, has been tried in Philadelphia for manslaughter, and acquitted. The trial occupied several days, and was finished last week.

Another Metal Discovered.

Dr. Hoffman, following in the wake of Davy and Deville, has come forward as a discoverer of metal. In a lecture delivered by him lately at the British Royal Institution he exhibited a bright glistening mass something resembling butter, and described it as ammonium—the metallic base of ammonia. This is regarded as a highly interesting chemical fact, inasmuch as it strengthens the views entertained respecting the constituents of the atmosphere, viz., that they are all metallic.—[Exc.

[If this is true, then the metal must be an alloy, because ammonia is composed of two gases,—nitrogen and hydrogen. It has been supposed by many chemists that a metal would yet be obtained from ammonia, because *amidogen*, always has been found combined with metals, and in organic compounds—never separate.

Giant Skeleton Found.

The Wheeling, Va., *Times* says: "A day or two since some workmen, engaged in subsoiling the grounds of Sheriff Wickham, at his vineyard, in East Wheeling, came across a human skeleton. Although much decayed, there was not much difficulty in identifying it, by placing the bones, which could not have belonged to other than a human body, in their primitive position. The impression made by the skeleton in the earth, and the skeleton itself were measured by the Sheriff and another person, both of whom are prepared to swear that it was ten feet nine inches in length. Its jaws and teeth were almost as large as those of a horse. The bones are to be seen at the Sheriff's office."

A great number of large bones, asserted to be skeletons of human giants, and found in various parts of the world, have turned out to be skeletons of animals—the elephant and mastodon. The above bones may turn out to be those of an elephant.

Blue and Black Indelible Ink.

Dissolve in a solution of iodide of potassium as much more iodine as it contains, and pour this solution into one of yellow prussiate of potash, containing as much of the solid prussiate as the whole amount of iodine. Soluble prussian blue precipitates and iodide of potassium remains in solution. After filtering, the precipitate is dissolved in water, and forms a blue ink, containing no free acid, and therefore adapted to steel pens. If the soluble blue be added to common black ink, from galls, the result is a black ink which cannot be removed from paper without destroying it.

London Mechanics' Institute.

This once popular Institution in the city of London, numbering 1300 members, is at present in a very poor condition. It has now only 363 members, and has appealed for public aid to sustain it. It is a shame for the mechanics of London to allow this institution to disentegrate as it has done.

To Bleach Sponge.

Sponge contains lime; this is extracted by steeping the sponge in dilute sulphuric acid for a few minutes, then washing it in water. It is now put into a clear dilute solution of muriatic acid, and a solution of chloride of lime added, then rinsed in water and passed through an acid bath. It is then put into very dilute sulphuric acid, and afterwards thoroughly washed, pressed out, and dried.

Sad Death of an Inventor.

John B. Fairbanks, for a short period engaged in this office, a few years since, committed suicide, in this city, on the 29th ult., while laboring under a fit of temporary insanity. He was an inventor of considerable originality, and an honest man.

The Clipper Races.

The race among the clippers from China to England, with the first cargo of tea for the present season, has been won by the American clipper *Maury*. She carried a cargo of 600 tuns of tea.

In the forests of California there is no undergrowth, scarcely anywhere a rock; the surfaces are as beautifully turned as if shaped by a landscape gardener, and dotted all over by myriads of flowers, more delicate, if not more various than any garden ever grew.

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W. J. D. of New York.—Soft solder is composed of 66 parts of lead and 34 of tin.

J K. of N. Y.—The articles on dyeing were published in Vol. 10. There is no cheap plan for dyeing a dark brown on wool that will enable it to stand a strong sour of sulphuric acid. You can, by dyeing the goods a red with camwood, topping them with a prussian blue, or dyeing them first an indigo blue, and a red on the top, with madder, camwood, cochineal, or lac.

F. W. C. of Vt.—India rubber has been proposed to line vessels, to prevent leakage in case of collisions at sea. It would answer a better purpose than gutta percha, but would be more expensive.

N. H. of Md.—Those who have made inquiries of us respecting the work called "The Tinman's Guide," wish to purchase it.

Wm. Hogan, of Hogansville, Ga., wishes to purchase the best spoke lathe to be had in the market. Address him as above.

J. P., of Mass.—We do not know of any one engaged in the manufacture of steel wire. It is proper for your postmaster to charge 2 cents each on foreign papers sent to your address.

G. M. M., of Tenn.—Patents have been secured for machines designed to reap, thrash, and separate the grain at the same operation. We believe they are considered impracticable, and, so far as we know, not one of them is now in use.

L. V., of Ill.—When boards are steeped a long period in a solution of the sulphate of copper, to preserve them, the solution should be weaker than when steeped in it only for a short period. Boucherie employs a stronger solution than that given by us. We cannot send you No. 28 of the last volume. We have seen drawings of Salaville's method of ventilating granaries. The power of a windmill is just in proportion to its strength and the pressure of the wind on its sails. A breeze of five lbs. pressure on the square foot exercises twice as much power as a gale exerting only half the pressure.

S. T. McD., of N. Y.—Any person stamping or printing the word "patented" on an unpatented article or machine, with the intention to deceive, is liable to a fine of $100 for each offence. The date of the patent must be stamped or marked on all patented articles, under a penalty of $100 for each neglect, if offered for sale by a patentee or assignee.

P. S. A., of Ala.—We cannot conceive how you can obtain a vacuum in your tube by the descent of water, when both ends of it are immersed in water. It is well known that in a pipe of uniform diameter, water falling in it will cause a partial vacuum, because its velocity increases with the time of its descent.

John E. Boatman, of Bainbridge, Ohio, wishes a machine for knitting ladies and gentlemen's *hoes*. Who can supply him with this kind of a machine?

L. F. H, of Vt—Sharp's breech-loading rifles are manufactured at Hartford, Conn. They can be purchased in this city. Some breech-loading rifles are very good for target shooting.

D. E. P., of Pa.—We did not receive your letter in time to do what you requested in regard to the milk preserving. If you intend to take out a patent for it, it will be better to defer the notice until such time as you might wish to publish an engraving of it.

B. J. V. M., of Pa.—Whirlpools revolve in all directions; they do not whirl contrary to the sun by any known law of nature. The water which you saw whirling down a pipe must have received its peculiar motion from the form of the pipe, or some other such cause. You will find the rules for obtaining the velocity of water under a head on pages 216 and 224, volume 11, Scientific American

B. W. M., of N. Y,—Good oil paint is the best for exposed brick or wood work.

U. B. V., of Pa.—Your suggestions in regard to the ventilation of ships or sailing vessels by means of suitable machinery operated by clock-work are not new. This plan was first suggested in 1830 by a Commodore in the Navy, for ventilating dwellings in southern countries.—Since that time it has often been proposed to us.

A. S., of N. Y.—Attempts have been made to produce such a machine as you describe, but as yet we believe no success has been attained. Send us a sketch of yours and we will examine it.

I. W., of N. Y.—The gyroscope is an old invention, but was not generally known until it was illustrated in our last volume.

H. M., of Pa.—In architecture there is an arch called the "flat arch," on account of its curve being hidden to the eye, because it embraces such a small part of a circle.

R. G. S., of Md.—Acetate of lead dissolved in water, then added to a solution of the bi-chromate of potash, precipitates the chromate of lead, which is employed as a yellow pigment in painting. You can easily manufacture it if you have chrome ore, as you state, on your farm.

J. M. B., of Ohio.—You will find rules for calculating water power in our last volume, and by applying them to your case you will be able to calculate the power of your fall exactly.

J. McC., of Conn.—You cannot employ a syphon usefully to raise water to drive a water wheel. The reason why a syphon raises water is owing to the unbalanced pressure of the atmosphere; its outside leg must always be lower than the water level which supplies it, and the excess of its length over the short leg, is all the power you could obtain. As you would have to dig a pit for this purpose, and would have no tail-race, you will perceive that the project is impracticable.

Money received at the SCIENTIFIC AMERICAN Office, on account of Patent Office business for the week ending Saturday, Nov. 29, 1856:—

S. P. S. of N. Y., $30; P. H. of Ill., $55; A. & R. of N. Y., $10; P. E, of Ala., $15; R. D. of Vt., $25: H. F, P. of Mich., $30; R. C. W. of O., $20; W. B. of Tenn., $25; K. & W. of Ind., $25; J. L. of Pa., $25; G. W. F. of Ind., $27; C. & W. of Md., $100; J. S. of Mass., $5: M. J. M. of Md., $15; T. G. of R. I., $25; V. R. D. of Ill., $30; J. G. E. of Pa., $30; J. R. of N. Y., $20, R. G. P. of N. J., $30; O. & W. N. of Conn., $30; W. F. of N. Y., $20; S. N. S. of N. Y., $60; H. P. of N. Y., $15; V. R. of N. Y. $20; G. E. H. of N. Y., $55; J. H. of Wis., $57; E. G A. of Mass., $100; W. S. of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 29:—

E. G. A. of Mass. (2 cases); R. D. of Vt.; W. B. of Tenn.; K. & W. of Md.; J. S. B. of N. H.; W. S. of L I.; G. W. F. of Ind.; T. G. of R. I.; J. S. of Mass.; J B. of Ill.; R. W. S. of Ala.; M. J. M. of Ind.

Important Items.

COMPLETE SETS OF VOLUME XII EXHAUSTED.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers except 1, 6, and 9, we can yet furnish, if new subscribers desire to commence back to the beginning of the volume; but unless they specially request to the contrary when making their remittance we shall commence their subscription from date of receipt of the order.

Subscribers to the SCIENTIFIC AMERICAN who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

INVENTORS SENDING MODELS to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

PATENT LAWS AND GUIDE TO INVENTORS.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis a this office upon application by mail.

RECEIPTS—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fees for copying.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

TO THE PRESS.—Any newspaper or publication which is entitled to the SCIENTIFIC AMERICAN on the terms prescribed in the Circular which was sent from this office a few weeks ago, and does not receive it regular, is requested to make complaint to this office, when the omission shall be promptly corrected.

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☞ All advertisements must be paid for before inserting.

IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had TEN years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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WOODWORTH'S PATENT PLANING MAchines—Patent expires Dec. 27th, 1856. Machines constantly on hand, together with steam engines and boilers of all sizes. Lathes, planers, drills, circular saw mills, belting of leather and rubber of the best quality. Orders respectfully solicited at the Machinery Depot, 163 Greenwich st. A. L. ACKERMAN. 13 8

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NOTE—"The Insurance Monitor" is published by T. Jones, Jr., No. 6 Wall st., and gives every information on insurance, standing of Companies, &c. Price $2 per annum. To those insuring with us, $1. 13 4

TWO TIMBER OWNERS, Speculators, and men of enterprise.—The new invention of A. Kendall for riving and shaving shingles is in market for a large portion of the United States. This machine splits and shaves with the grain of the wood, three thousand shingles per hour. All kinds of splitting timber, whether hard or soft, can be worked to like advantage. All difficulties heretofore experienced in riving timber by machinery is overcome by Kendall's invention, as it splits and shaves two shingles at a time. Although this machine has been before the public but a few months, the demand for machines and rights is unprecedented. Communications addressed to O. K. CHAMBERLIN, Albany, N. Y., in reference to machines and rights will receive attention. The machine is in operation at 797 Broadway, Albany. 1*

TWO CAPITALISTS—A gentleman thoroughly acquainted with the business, having a large western acquaintance, and who can command one of the best assortments of patterns in the country, wishes to form a connection with some foundry building, or already established in some western city, to carry on the architectural foundry business, either as partner or employee. The best references given. Address Box No. 1149, P. O. New York City. 1*

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RUNYAN & HOSTER, of Seneca Falls, Seneca County, N. Y., are now prepared to fill orders for any or all sizes of Lewis' Improved Direct Double-Acting Force Pump, the best pump in use. A full description of it may be found in the Scientific American of March 22d, 1856. Rights are also offered for sale by States or otherwise. R. & H. refer to J. T. Miller, Esq., P. M., Seneca Falls, N. Y. 13 12*

A. & J. T. SPEERS' Central Depot for the sale of patent rights, patented articles, &c., No. 212 Broadway, New York. 13 6*

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CHARLES W. COPELAND,
1 eowtf Consulting Engineer, 64 Broadway.

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GUEST'S SOUNDING GUARD.—Described in SCI. AM., Vol. 12, No. 9. Rights for rivers, lakes, or ports, for sale, or the whole patent, except the right for U. S. Government vessels. Address
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ROPE MAKERS should get particular information about a very valuable invention. The Empire Rope Machine (patented July last by T. G. Boone) occupies not 20 inches square, makes superior rope twice as fast, with not half the power required for other machines.—Such are facts. Address, A. J. T. SPEER,
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HARRISON'S GRIST MILLS—20, 30, 36 and 48 inches diameter, at $100, $200, $300, and $400, with all the modern improvements. Also, Portable and Stationary Steam Engines of all sizes, suitable for said Mills. Also Bolters, Elevators, Belting, &c. &c. Apply to
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P. S. PEASE, 61 Main st., Buffalo, N. Y.

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NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,

Office for sale of rights at 27 State street, Boston, and Lowell, Mass, 45 6m*

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 1 tf

HARRISON'S 30 INCH GRAIN MILLS—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn. 1 tf

BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 41 tf

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Science and Art.

The Cochineal Plant.

The last report of the Patent Office relating to agriculture directs some attention to the cultivation of the above plant. The fact is, there is no difficulty connected with its cultivation; it grows abundantly in Florida and Texas; but that is a very different question from rendering it profitable. This plant of the cactus tribe is cultivated in Mexico and Honduras for the sake of the insect or bug which feeds upon it, and which is employed for the purposes of dyeing red, crimson, and scarlet colors on silk and wool. It is sold at present for about one dollar and a half per pound—retail price—and is an expensive article. It is employed with a mordant of the chioride of tin and cream tartar in dyeing, and with alum for making fine carmine inks, and lakes for painting. The colors produced from it are very brilliant and beautiful—no other known red coloring drug equals it. Were it cheaper, more of it, no doubt, would be employed, and it would save a great amount to the country every year, as *lac* which is imported from the East Indies is now used extensively as a substitute for it, simply because it is cheaper, although it requires four times more of it to produce as intense a color and is not so brilliant then.

But can we cultivate the cochineal cheap? that is the question. The dye drug is the insect, not the plant. Now the insects are small —only about the size of large rose-bugs —therefore, when they are dried it takes very many of them to make a pound. Without cheap labor to attend the plants, smoke the bugs, and gather them in sheets from the cactus, there is no use of attempting to cultivate the plant for the insect. The cultivation of the cochineal in Texas is simply a question of economy, not of climate or soil. The Indians are the only persons employed to collect these insects in Mexico, and they labor for a few cents per day.

We direct attention to this question, in order that those of our readers who own lands in Texas and Florida may know exactly what are the real difficulties in the cultivation of cochineal. It would be a source of great pleasure to us, and profit to our country if this insect could be raised cheaply and in abundance. Can this be done?

Renovating Furs.

As the season for wearing furs is at hand, a few words on the subject will be useful to many persons.

Muffs, capes, cuffs, and other articles of fur should be beaten smartly with a switch, then brushed with a stiff brush, and carefully examined. If there are any moth-eaten parts in them they should be cut out, and their places supplied with other pieces of fur which match them in color, neatly sewed in. The lining and stuffing will have to be removed for this purpose. White furs should be rubbed over smartly with a stick of pipe clay, then switched, and afterwards carefully brushed. This operation will make them look clean.

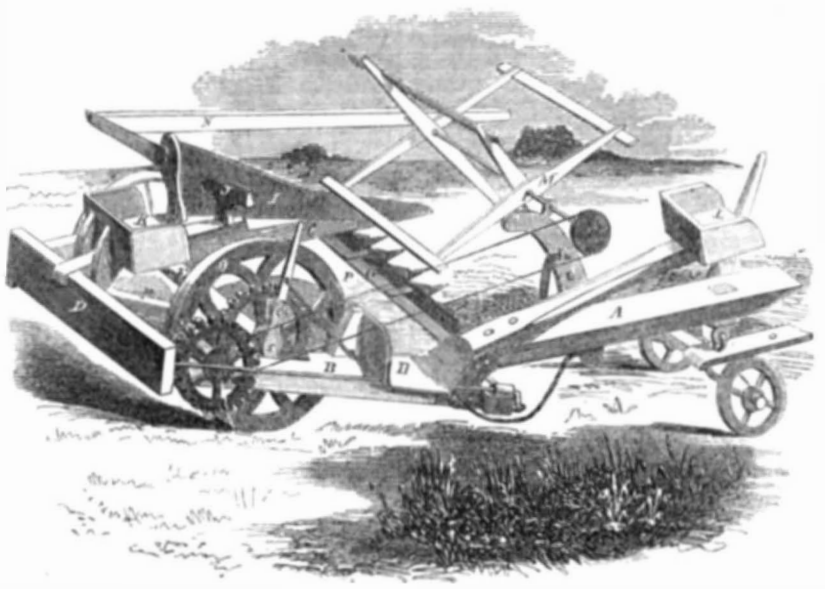
To remove grease from furs they require to be treated thoroughly by a person engaged in the business; still, any person may remove some of the grease from a muff or cape by placing the article on a table, covering the spot with a layer of soapstone dust about an inch deep, laying a sheet of blotting paper upon it, and on the top of that a warm flat iron—not too hot. The heat of the iron softens the grease in the fur, and the soapstone dust then absorbs it. Warm soapstone dust rubbed among furs, then switched out and brushed off improves their appearance. Soapstone dust can thus be employed for all kinds of fur, and of every color.

Cure for Rheumatism.

The following from the *Medical World* may be very beneficial to many persons who are suffering and subject to such a painful complaint as rheumatism:—

"Where one-third of the male population complain to some extent of rheumatic pains, in the fickle climate of New England, but more especially along the sea shore, physicians have it in their power to mitigate an immense amount of severe suffering by prescribing the volatile oil of mustard. It is employed as a rubefacient, being first diluted in its own weight of alcohol at forty degrees. Some patients may object to its pungent odor, but that is temporary, while the remedy may, in some cases, prove a permanent cure. Make the application at least twice a day, and protect the part with soft flannel. Mustard mills are in operation in the cities generally, at which the oil may be procured, it being an article not much in demand in the arts. Were it not for detecting it by a pungent odor, this oil would have become a secret remedy for rheumatic pains years ago. A nostrum loses miraculous efficiency and curative properties on becoming known."

MANNY'S REAPING MACHINE.



This figure is a perspective view of Pells Manny's improved Harvester, embracing the result of several patents—two being granted on the 21st of October last. These two cover improvements in preventing the cutters from choking; also in preserving them horizontally, while the finger also conforms to the inequalities of the ground. Anoter, granted on the 4th of last month, relates to an improvement in the raking operation.

A B C D represent part of the framing supported on the truck or running part. E is the main driving axle, and F is the adjusting bar. O is the driving wheel. The reel, M, is revolved by a band passing over pulleys, as shown. I is the guide wing board of the machine bounding the platform, P, on which the cut grain is received K is the raker's seat. The grain is raked out at the discharge chute, H. G is the finger bar; L the driver's seat; N is the reel rail, and J the raker's rest.

The cutters receive their traversing motion from the crank on the end of their connecting rod (which passes under the discharge chute, H,) and which is revolved in the usual way.

The fingers connected with the cutters are inclined on their upper surfaces downwards and towards the back ends, and they are also of a concave form. There is a space allowed between the cutters and the finger bars, and the cutters are prevented from clogging, for when cutting grass, which is the most liable to clog, it has an opportunity of passing backwards underneath the cutter bar, and it is cut and cleared by a set of back cutters on the bar.

The adjusting bar, F, is placed diagonally underneath the frame, and its ends are connected to the finger bar of the machine; a screw passes through the axle, E, and bears upon bar F, therefore by operating the screw, the bar, F, may be depressed in the center, so as to keep the finger bar perfectly horizontal. This bar prevents the front end of the frame from sagging.

By the form of the guide wing board, the cut grain is received on the platform, to allow the raker to rake it off at the side, in gavels or bundles with the heads of the grain outwards. By the manner in which this bar is connected with the front wheels, and the back part of the frame, supporting the cutter bar, the cutters are allowed to conform in position to inequalities of ground, and at the same time they are held firmly in position for cutting in the heaviest grass or grain.

The claims of the two recent patents alluded to, of Mr. Manny, will be found on page 58 this volume Scientific American, where the objects of the improvements are briefly set forth.

Mr. Manny is one of the original inventors of the successful combined Reaper and Mower, and has devoted many years of time, study, and labor to improve this great labor saving machine for farmers. It has now been demonstrated that such machines can do the work of reaping or mowing, as well as it can be done by hand, saving an immense amount yearly to farmers, who—to their praise be it spoken—have duly appreciated the benefits conferred upon them, by their liberal patronage of such machines. Mr. Manny is devoting himself to the improvement of other agricultural machines, believing that great improvements can yet be made in them all, and he is right. He has lately invented some new improvements for which he has applied for patents, these he adds to all his new machines.

More information may be obtained from him by letter (or otherwise) addressed to Waddam's Grove, Stephenson Co., Illinois.

New Seedling Strawberry.

Mr. Charles A. Peabody, of Columbus, Ga., has originated a new seedling strawberry of the *Hautbois* species, which promises to be of great value. The *Soil of the South* says:—

"It is hermaphrodite in its character, producing fruit without an impregnator, being itself a capital impregnator for pistillate varieties. It is a hardy, vigorous grower, withstanding both cold and heat without injury. In good soil the vine grows to an enormous size, we have single plants that cannot be covered by a half bushel measure. The fruit is borne upon tall stalks, suspended on stems from three to five inches long, attached to the calyx by a coral-like neck, without seeds—there being very few seeds in the berry. It is of singular and beautiful form, somewhat irregular, and sometimes compressed, of the largest size, frequently measuring seven inches in circumference; flesh firm, melting, and of the most exquisite pine flavor, requiring no sugar for the dessert, rivaling the far-famed Burr's New Pine. It is a prolific bearer, opening its blossoms during the mild days of winter, and perfecting its fruit as soon in the spring as the weather will permit. When fully ripe, the color is of a rich, dark crimson. But its rich color, beautiful form, magnificent size, and exquisite flavor, are not all its recommendations; through its firmness and lack of acidity, it bears transportation better than any strawberry ever introduced."

We have seen an elegant colored drawing, showing the plant in full bearing, the very sight of which made our mouth water. The "Peabody" seedling will become all the rage if it thrives as well at the North as it does down South.

Entomology.

Professor Agassiz says that more than a lifetime would be necessary to enumerate the various species of insects and describe their appearance. Meiger, a German, collected and described 600 species of flies which he collected in a distance of ten miles circumference. There have been collected in Europe 20,000 species of insects preying on wheat. In Berlin, two professors are engaged in collecting, observing, and describing insects and their habits, and already they have published five large volumes upon the insects which attack forest trees.

Literary Notices.

Dr. Kane's Arctic Expedition—This splendid work has just been issued in two volumes. It is illustrated with a great number of beautiful steel plates and wood cuts, and the paper and typography are excellent. It is full of thrilling adventure. The many perils which Dr. Kane and his companions encountered in the lonely, dreary, dangerous Arctic regions are detailed in a graphic manner. Dr. Kane discovered the open polar sea and although much suffering has been endured by all Arctic expeditions, and the North-West Passage discovered, we are of opinion that we have not seen or heard of the last of them. This open Polar Sea will attract other daring navigators to go and seek to explore its boundaries. This work is published in two handsome volumes, by Childs & Peterson, of Philadelphia, and it has already had a deservedly large sale. It is a book which should be in every respectable library. For sale by Putnam & Co., publishers, Broadway, this city.

Porter's Chemistry—Messrs. A. S. Barnes & Co., John st., this city, have just issued this excellent work, by Professor Porter, of Yale College. It is intended to be a hand and class book for practical study. It contains the elements of the science, describing easy methods for acquiring a very good knowledge of it. It is illustrated with excellent wood cuts of simple apparatuses, to show how the experiments may be performed. The style of the author is brief and clear, containing a great deal of information in a very small space. We welcome this work as a valuable contribution to our scientific literature. It is adapted for the higher schools and academies, and for private study.

If any of our readers desire to take a journal devoted to metallurgy and mining, we recommend the Mining Journal, edited by Wm. J. Tenny. It is a good work. Published monthly by John F. Trow, 377 Broadway.—Terms, $5 per annum.

Gardner on Sterility—This is a work by Dr. Augustus K. Gardner, of this city, on the above subject; published by Dewitt & Davenport, Nassau st. It is illustrated with excellent colored plates, and is well printed, making a handsome volume. It has caused considerable controversy among the faculty; some speaking of it in the highest terms, and others expressing a reverse opinion. It is admitted to be ably and clearly written, containing much not before known on the subject.

The Knickerbocker—This old favorite lively and intellectual magazine for this month, contains eighteen original papers—stories, poetry, &c., besides literary notices, and the usual feast of humor in the Editor's Table. It contains a criticism of Bothwell—Professor Ayton's late poem. Published by S. Hueston, No. 348 Broadway.

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